VOLUME 28 NUMBER 11

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NEXT MONTHLY MEETING, OCTOBER 8, 1907

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

PROCEEDINGS

JULY, 1907

THIS SPECIAL NUMBER OF PROCEEDINGS CONTAINS MUCH OF VITAL INTEREST. PROGRAMS ON THE VARIOUS MEETINGS TO BE HELD IN THE FALL ARE OUTLINED. BRIEF NEWS ITEMS CONCERNING OTHER ACTIVITIES OF THE SOCIETY ARE GIVEN. EVERY MEMBER WILL BE INTERESTED IN THESE SHORT ANNOUNCEMENTS COVERING THE WORK OF THE SUMMER AND EARLY FALL.

NEW YORK MEETING, DECEMBER 3-6, 1907

JUL. 8 1907 LIBRARY

JULY, 1907 VOL. 28 No. 11

THE AMERICAN SOCIETY OF
MECHANICAL ENGINEERS

PROCEEDINGS

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The professional papers contained in Proceedings are published prior to the meetings at which they are to be presented, in order to afford members an opportunity to prepare any discussion which they may wish to present. They are issued to the members in confidence, and with the understanding that they are not to be published even in abstract, until after they have been presented at a meeting. All papers are subject to revision.

The Society as a body is not responsible for the statements of facts or opinions advanced in papers or discussions.

Proceedings is published twelve times a year, monthly except in July and August, semi-monthly in October and November. One copy of each issue without charge to members.

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PROCEEDINGS

OF

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

VOL. 28 JULY 1907 NUMBER 11

A special meeting of the Society will be held Tuesday evening, October 8, in the Engineering Societies Building, to take action on the proposed merger of The Mechanical Engineers Library Association and The American Society of Mechanical Engineers. This consolidation has been approved by the Councils of both bodies, acting in accordance with legal advice. The text of the merger is extensive and voluminous and for this reason is not made a part of this magazine. Copies however are being prepared and will be ready for distribution at the meeting in October.

Members who do not expect to be able to be present at the meeting in October are urgently requested to fill out the enclosed proxy blank authorizing the President to act for them. The blank need not be detached. On the same evening will be held the regular monthly meeting of the Society.

NOMINATIONS FOR OFFICERS

The Nominations Committee will be pleased to receive suggestions of names of members of the Society to fill the various offices falling vacant at the next election in December. They also desire that in the proposal of a name, reasons may be given which recommend the person for the specified office, since such recommendations are very helpful to the Committee in determining the suitability and desirability of the nomination.

The purpose of this plan is to enable the whole membership to participate in the suggestion of nominations, and especially to enable any member to present his views to the Nominations Committee in such manner as will insure their careful consideration before the work of the committee is concluded.

Juniors are not eligible for office in the Society.

There are to be elected the President, term of office, one year; three Vice-Presidents, term of office two years; three Managers, term of office three years, and a Treasurer, term of office one year.

The terms of the following officers expire December, 1907.

President

FREDERICK R. HUTTON
Not eligible for re-ele tion as President.

Vice-Presidents

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WALTER LAIDLAW A. J. CALDWELL
FRANK G. TALLMAN G. M. BASFORD
FREDERICK M. PRESCOTT A. L. RIKER

Please fill out the enclosed suggestions for nominations blank. This blank can be sent without being detached in the addressed envelope to the Society, or it can be detached and forwarded direct to the chairman of the Nominations Committee, Prof. Robert H. Fernald, Washington University, St. Louis, Mo.

BALLOT FOR MEMBERSHIP

Immediate attention to the enclosed Ballot for Membership is requested from the members. The ballot closes on July 20, and after that date no further votes can be received. It is expected that another ballot will be ready for distribution in the late summer.

The ballot need not be detached from the sheet of which it constitutes one of four parts. The sheet can be returned as a whole to the Society in the enclosed addressed envelope. If for any reason

a member wishes to hold the Proxy, Suggestions for Nominations, and Subjects and Discussions Suggestions, or any one of them, he is urged to mail the Ballot for Membership at once.

TOPICS FOR PAPERS AND DISCUSSIONS

In considering subjects to be taken up at the semi-annual meetings of the Society, the Meetings Committee is sometimes hard pressed to decide what will be of the widest interest to members from all parts of this country and from abroad.

The subjects can be intelligently determined only by feeling the engineering pulse practically all over the world. To do this is a difficult problem. Individual letters to our extensive membership are next to impossible. Circular letters excite no personal responsibility and in nineteen instances out of twenty are consigned to the waste basket unread, or at most unanswered.

To realize the expressed aim of the Society, "the advancement of the arts and sciences relating to engineering and mechanical construction," the subjects taken up at these larger meetings should be broader than the problems peculiar to a few localities. We must know what the member in Maine as well as the member in California wants to hear discussed at our meetings and through our publications.

Every engineer in becoming a member subscribes to the common aim of the Society and should feel a personal responsibility in its proceedings, since its most important function is the publication of papers discussing representative problems and containing information which the engineering world wants to know. We need the aid of members in this work. You are requested to write freely to the Committee on Meetings, suggesting topics and mentioning wherever known those who are able to treat the subject broadly.

As an enclosure with this number a "Subject and Discussion" blank will be found to facilitate the sending in of information. It is hoped that all members will fill in the blanks and send them to the Meetings Committee through the Society's office.

THE MEETINGS PROGRAM

The first monthly meeting of the Society which, according to the custom established this year is scheduled for October 8—being the second Tuesday in the month, will take up a subject in which engineers and manufacturers alike are interested, "The Relation of the College

Technical Course to the Apprenticeship Course in Industrial Establishments" an address by Prof. John P. Jackson of Pennsylvania State College.

To add to the interest and to conform to the general policy of the Society in securing all the information possible on the subject taken up at a meeting, eminent educators whose experience and success mark them as authorities will speak on other phases of the technical education problem. Professor Dugald C. Jackson, of Massachusetts Institute of Technology and President of the Society for the Promotion of Engineering Education, will make a short address on the "Promotion of Engineering Education."

Dr. Henry Pritchett, President of the Carnegie Foundation and President of the American Society for the Promotion of Industrial Education, will speak on "The Promotion of Industrial Education."

All members interested in these timely subjects should arrange to be in New York for this meeting. Other discussions are invited, and if the authors wish to have them published previous to the meeting they should be submitted by September 10.

It is hoped that the members will give their endorsement of the efforts of the Meetings Committee to provide addresses and discussions on subjects of real benefit to the profession, by a liberal attendance at these monthly meetings.

The meeting on November 11, the second Tuesday in November, will be given over to papers and discussions on the problems of the elevator in our modern high buildings. Mr. Charles R. Pratt will read a paper which has special bearing on the elevators of the new Singer building and those of the tower of the Metropolitan Life Insurance building. As these buildings when completed will be the highest structures in the world, each of which will be over six hundred feet, the problem of elevator service if solved successfully should fully represent the progress of this department of engineering at the present time.

If the author of discussion desires to have it printed before a meeting, it should be sent to the Society not later than the tenth of the month preceding the meeting at which it is to be presented. Discussion to be read at the November meeting should be received before October 10.

Attention is called to the action of the Council, reported in Proceedings for June, to the effect that the monthly meetings of the Society will be considered as offering equal opportunities for the presentation of technical papers and discussions as the Annual and Spring Meetings, and that papers and discussions so presented shall be considered

by the Publications Committee for the Transactions in the same manner as if presented at the Annual or Spring meeting.

The Annual Meeting, December 3–6, promises to be one of the most interesting in the history of the Society. It will be the first general meeting in the new headquarters. A special invitation has been issued to each of our honorary members to be present and so give the occasion special significance. Several of them have already accepted. Attractive excursions to points of engineering interest in the vicinity of New York are being arranged.

The leading topics will be "The Gas Engine and the Gas Producer" with exhaustive reports on the state of the art in America, by Prof. Robert H. Fernald, of Washington University, St. Louis, who is in charge of the Gas Producer Division of the United States Geological Survey Fuel Testing Plant. Professor Fernald is to make a tour of inspection of the United States this summer, and will give the Society the benefit of his observations.

Another report regarding European practice will be presented by Mr. F. E. Junge, member of the Verein Deutscher Ingenieure, who is now abroad making a tour of inspection in Europe. The members will recall Mr. Junge's paper "On the Evolution of Gas Power" which was received with a great deal of interest at the last Annual Meeting. Further information from Mr. Junge who has made a comprehensive study of this subject as affected by European and American practice will be received with interest by present and prospective users of gas power.

A second topic will be the symposium on the subject of "Modern Foundry Practice." The third topic will be the problem of "Train Lighting" in all of its phases. Both of these topics will be treated with thoroughness.

All members desiring to offer papers on these subjects are urged to send them to the Secretary in August, or at the latest early in September, so that they may be printed and distributed considerably in advance of the meeting.

SOME SUMMER ANNOUNCEMENTS

The first number of Proceedings, Volume 29, will appear September 1. It will contain papers to be presented at the December meeting. Committee chairmen and others desiring to reach the members with announcements are asked to bear this early publication date in mind.

The Pocket List for 1908 will make its appearance about July 1. Corrections in address received up to the end of May will be included.

Members are urged to report changes of address and occupation as they occur. Changes of address received since the Pocket List forms were closed and such as may be reported during the summer will appear in September Proceedings.

The offices of the Society will be open during the summer months during the same hours as during the balance of the year, 9 a. m. to 5 p. m., and until 1 p. m. on Saturdays.

Transactions, Volume 28, is now in the hands of the Publications Committee for revision. It is expected that it will be issued about October 1. It will be sent free of charge to all members in good standing.

Attention is again called to the private office for the use of members which is a part of the offices of the Society. This room is designed to meet the needs of members temporarily on business in New York. It affords a splendid place for conferences and where the ordinary office work incident to such a trip can be carried on with the least annoyance. The telephone and messenger service of the Society is accessible to members. Upon short notice stenographic assistance can be furnished and the charge for this accommodation is moderate.

The Society will be pleased to furnish the twelve numbers of Proceedings, Volume 28, bound in two volumes to any one wishing them. The price to members in half morocco, $7.50; to non-members, $10. The value of having these copies of Proceedings bound together is that the year's work of the Society is given in full, without the reëditing necessary for Transactions. A complete account of the Dedication Exercises is contained in May and June Proceedings and this will not be published in Transactions. Orders for these copies will be filled as soon as possible after their receipt.

An application blank is enclosed with this number of Proceedings, and it is hoped that each member will show his interest in the Society by handing this application to the most eminent engineer of his acquaintance who is not now a member of the Society. It must be apparent to every member who has any large acquaintance in the profession that many of the most representative practitioners are not affiliated with the Society.

THE INDIANAPOLIS MEETING

The Spring Meeting just closed in Indianapolis was one of the most successful semi-annual meetings the Society has held.

On Tuesday evening, May 28, at the opening session Mayor Bookwalter made an address of welcome to which President Hutton responded. A reception was afterward held in the parlors of the Claypool Hotel, when the members and their wives and guests spent the evening socially. A light collation was served.

At the Wednesday morning session the reports of Committees were read, the business of the Society transacted, and professional papers presented. In the afternoon visits were made to the Atlas Engine Works, the National Motor Vehicle Company, the Nordyke-Marmon Plant and the Parry Manufacturing Plant.

The ladies visited the Eli Lilly Company and in the afternoon they were taken in automobiles to the Country Club where they were given a tea by the Social Committee. Mr. William Rockwood, chairman of the committee for the entertainment of the ladies, and the Indianapolis ladies who lent their aid were most successful in their arrangements.

Thursday morning was devoted to a session on superheated steam and in the afternoon the members and ladies attended the unveiling of the Lawton Monument, where President Roosevelt made the address. The Committee had secured special seats for the members of the Society and guests. Thursday evening a formal reception was held in the Claypool Hotel when President Frederick R. Hutton and Mrs. Hutton, Secretary Calvin W. Rice and Mrs. Rice, Chairman J. R. Whittemore of the Local Committee and Mrs. Whittemore received the members and guests.

Friday was spent at Purdue University. The Society was met at the gate by representatives of the University, and escorted to the Chapel where an address of welcome was made by Prof. W. F. M. Goss, Dean of the University, to which President Hutton responded. Superheated steam was taken up as the subject of the professional session and the scheduled papers read and discussed.

A delightful luncheon was served in the Agricultural Building after which the party was conducted over the grounds, and special visits made to the laboratories. One of unusual interest was the locomotive testing laboratory, with its collection of historic locomotives. A committee of ladies from the University received the ladies of the party, and very graciously provided for their entertainment.

The entire local committee deserves commendation for their efforts

in making the meeting very successful. Following is a list of the chairmen whose able committee work provided most comfortable arrangements and very interesting entertainment for the visiting members and ladies: J. R. Whittemore, general chairman; L. M. Wainwright, chairman of finance committee; William Rockwood, chairman ladies committee; H. H. Rice, chairman entertainment committee; W. G. Wall, chairman hotel committee; Theodore Weinshank, chairman printing and press committee and Russell M. Seeds, advertising manager.

REPORT ON A STANDARD BASIS FOR REFRIGERATION

A preliminary report of the Committee on a Standard Tonnage Basis for Refrigeration was presented at the Indianapolis meeting. The Committee wishes it to be clearly understood that this is a preliminary report in every sense of the word and as such is open to discussion. In fact discussion is not only invited but requested.

Great efforts have been made by the Committee to complete this preliminary report for the purpose of having it freely discussed. Members who have data on the subject should feel a personal responsibility about communicating them.

The Society is particularly fortunate in the personnel of this Committee, as it is constituted not only by representatives of this Society, but of the Society of Refrigerating Engineers as well. When completed the report will represent the best thought of the two societies.

Again we wish to ask members to read and very carefully criticise the report which was published in April Proceedings. Discussion or informal suggestions can be addressed to Prof. D. S. Jacobus, Chairman, 85 Liberty Street, New York.

CHANGES IN BY-LAWS

In accordance with the provision of C59 the Society is hereby advised of the following addition to the By-Laws made by the Council on May 30, regular notice of such two additions having been given at the meeting of the Council on April 16.

B 44 That standards for the conduct of the business affairs of the Society, of its professional or business meetings, and of its committees and their activities may be established, amended, and annulled by a two-thirds vote of the members of the Council present at a meeting, provided that a written notice of the proposed addition or change may have been given at a previous meeting of the Council, and provided further that the Secretary shall have sent to each member of the Execu-

tive Committee, acting as a Committee on Standards, a draft of the proposed addition or change at least two weeks prior to the meeting at which they are to be voted on.

B 45 That directions for the conduct of the business affairs of the Society may be established by the Secretary and the work covered shall be carried out as provided by these directions. These directions may be added to, amended, or annulled by the Secretary but it shall be his duty to send to each member of the Executive Committee, acting as a Committee on Standards, a draft of the change before it is put into effect.

MINING ENGINEERS SUMMER MEETING

The Ninety-third Meeting of the American Institute of Mining Engineers will be held at Toronto, Canada, beginning on Tuesday afternoon, July 23. The program includes professional sessions, a reception in the Parliament Building, an excursion to Cobalt, including a visit to the mines, excursions to points of scenic and scientific interest, a steamboat trip up Lake Temagami and a visit to Sudbury. Special arrangements can be made for trips to the mining districts of southeastern Ontario.

The Secretary of the Institute cordially invites members of our Society to take part in the excursions and sessions of this meeting. Any who may wish to avail themselves of this very generous offer from our sister Society should apply to the Secretary for the proper credentials to present to Secretary R. W. Raymond. Notice must be received in advance in order that proper provisions may be made for guests. Circulars and full information will be sent to members of the Society upon request through this office to Secretary Raymond of the American Institute of Mining Engineers.

APPOINTMENT OF HONORARY VICE PRESIDENTS

The Centennial Celebration of the founding of the University of Tennessee will be held at Knoxville, Tenn., June 1 to 3.

The following gentlemen have been appointed by the President as Honorary Vice Presidents to represent the Society:

Mr. Newell Sanders, Chattanooga; Prof. Charles S. Brown, Vanderbilt University, Nashville; and Mr. F. R. Jones of Knoxville,

To represent the Society in the same capacity at the second unveiling of bronze tablets in the Hall of Fame, New York University, the President has appointed Mr. Jarvis B. Edson, Mr. George R. Henderson; Mr. Benjamin F. Isherwood, Honorary Member of the Society, Chief Engineer, U. S. N. Ret., and Mr. Henry Harrison Suplee, all of New York.

EMPLOYMENT BULLETIN

The Society has always considered it a special obligation and pleasant duty to be the medium of securing better positions for its members. The Secretary gives this his personal attention and is most anxious to receive requests both as to positions and as to men available. Notices are not repeated except upon special request. Copy for notices in this Bulletin should be received before the 15th of the month. The list of men available is made up entirely of members of the Society and these are on file, with the names of other good men, not members of the Society, capable of filling responsible positions, information about whom will be sent upon application.

POSITIONS AVAILABLE

056 Boiler salesman for Philadelphia concern.

057 Master mechanic for manufacturing concern. Position requires a man of experience and fair technical knowledge. Location, New England.

058 High class superintendent for growing works near New York, engaged in manufacture of goods for electrical installations. Applicant must have successful record as superintendent or manager, and practical engineering experience. Technical education. Must demonstrate ability to engage competent assistants, organize departments, increase output and lower costs; direct design and construction of special tools, electrical appliances, special machinery, piping, millwright work, woodworking, power plant, etc. Salary in keeping with ability. State training, experience and references.

059 First-class practical mechanical engineer or designer for factory; one hour from New York. Able to show good knowledge of physics, mechanics and electricity; plan and perfect new machinery, tools and methods as occasions arise. Practical machine shop experience necessary.

060 Salesman wanted for the sale of condensers. Philadelphia concern.

061 Wanted in engineering department of Western Pennsylvania concern, several high grade men for mechanical, structural, electrical and hydraulic work.

062 Draftsman wanted who has had experience in machine tool building.

063 Draftsman wanted who is experienced in factory lay-outs and power plant designs.

064 Superintendent of shops manufacturing medium and heavy crushing and pulverizing machinery, sugar cane mills, vacuum pans, and similar apparatus.

MEN AVAILABLE

In addition to the list of men available, the Society is pleased to announce that one of the colleges has volunteered to undertake to supply both undergraduate and graduate students for part time, summer, and permanent positions. The Secretary will be pleased to be the medium for correspondence.

95 Junior member, 31 years of age desires change in position. Seven years drawing room experience, designing Corliss engines, boilers, mining machinery, power plants and special work. Three years machine shop; three years special work on road, inspecting, erecting, and selling. Wishes position as salesman with manufacturing concern in the Middle States.

96 Graduate Worcester Polytechnic; varied experience as general manager, manager of sales, general superintendent and mechanical engineer.

97 Technical graduate in mechanical engineering with five years' experience in the design and installation of heating layouts and power equipment, also in charge of sales, desires responsible position with railroad.

98 Graduate mechanical engineer with five years' experience in shop, laboratory and office. At present employed in municipal work, desires to connect with manufacturer or contractor in the vicinity of New York.

99 Technical graduate in mechanical engineering. Eight years in charge of design, erection and operation of complete plants for bituminous coal mining using compressed air and electricity and requiring heavy pumping installation.

100 Chief engineer. Experienced in charge design, shop and purchasing work of large machine shops.

101 Graduate Worcester Polytechnic; five years' experience in heating, ventilating and mechanical draft systems; installation of

engines, pumping machinery, blowers, etc. Charge of branch office for two years; desires position as mechanical engineer or assistant mechanical engineer with railroad or other corporation.

102 Mechanical engineer of long training, good technical education and practical experience in designing and building machinery desires a position as instructor in mechanical engineering, machine design, machine shop work, etc., in a technical or trade school where executive ability would also be desirable.

103 Mechanical and electrical engineer, age 31; technical graduate having had 12 years practical experience in shop, drafting room and office, desires change for position as superintendent or assistant.

NEW BOOKS

SEWAGE AND THE BACTERIAL PURIFICATION OF SEWAGE. By Samuel Rideal. *John Wiley and Sons, New York, 1906.* 8vo, 367 pp., 58 illus. Cloth $4.

Contents, by chapter headings: Introduction; Chemical Analysis of Sewage and Effluents; Bacteria and other Organisms in Sewage; Chemical Changes Produced by Bacteria; Irrigation and Sewage Farms; Subsidence and Chemical Precipitation; Sterilization by Heat, Chemicals, and Electricity; Bacterial Purification; Distribution and Distributors; Sewage Outfalls and Discharge; Agricultural Value of Bacterial Effluents; Trade Effluents; Index.

THE TEXTILE FIBERS, THEIR PHYSICAL, MICROSCOPICAL AND CHEMICAL PROPERTIES. BY J. MERRITT MATTHEWS. *John Wiley and Sons, New York, 1907.* 8vo, 480 pp., 126 figures. Cloth, $4.

Contents, by chapter headings: Classification of the Textile Fibers. Wool and Hair Fibers: The Chemical Nature and Properties of Wool and Hair Fibres; Shoddy and Wool Substitutes; Minor Hair Fibers. Silk: Its Origin and Cultivation; Chemical Nature and Properties of Silk. The Vegetable Fibers—Cotton: The Physical Structure and Properties of Cotton; Chemical Properties of Cotton; Cellulose; Mercerized Cotton; Seed-Hairs other than Cotton; Artificial Silks; Lustra-Cellulose; Linen; Jute; Ramie; Hemp; and Minor Vegetable Fibers; Quantitative Analysis of the Textile Fibers.

Appendix 1: Microscopic Analysis of Fabrics. Appendix 2: Machine for Determining Strength of Fibers. Appendix 3: Commercial Varieties of American Cotton. Appendix 4: Bibliography of the Textile Fibers.

DENATURED OR INDUSTRIAL ALCOHOL. BY Rufus Frost Herrick. *John Wiley and Sons, New York, 1907.* 8vo, 512 pp., 163 figures. Cloth, $4.

Contents, by chapter headings: Composition, History, and use of Denatured Alcohol; The Manufacture of Alcohol; the Distillation and Rectification of Alcohol; Alcoholometry; The Cost of Alcohol and of Alcohol Distributing Plants; Alcohol as an Illuminant; The Fuel Value of Alcohol Compared With the other Usual Liquid Fuels; Alcohol as a Source of Power; Laws and Regulations for Denatured Alcohol in the United States.

Appendix: The U. S. Regulations and Instructions Concerning the Denaturation of Alcohol and the Handling and Use of Same Under the Act of Congress of June 7, 1906. Amendments to the Act of Congress of June 7, 1906. Report of the British Departmental Committee on Industrial Alcohol. Presented to both Houses of Parliament by Command of His Majesty, March 23, 1905. Appendices from Minutes of Evidence Taken before the British Departmental Committee on Industrial Alcohol; Presented to both Houses of Parliament by Command of His Majesty. Abstract from British Revenue Act, 1906, as to Spirits Used in Art, Manufactures, etc., and Supplemental Amendments of the Spirits Act. Bibliography of Denatured Alcohol and Books of Reference. List of Patents Relating to the Manufacture of Alcohol and Alcohol-Distilling Apparatus.

NAVIGATING THE AIR. A Scientific Statement of the Progress of Aeronautical Science up to the Present Time. BY The Aero Club of America. *Doubleday, Page and Co., New York, 1907.* 8vo, 258 pp., Cloth.

Contents, by chapter headings: Preface, by Cortlandt Field Bishop; Introduction, Practical Air Craft, by Carl Dienstbach; The Wright Brothers' Motor Flyer, by O. Chanute; The Relations of Weight, Speed, and Power of Flyers, by Wilbur and Orville Wright; A Few Notes of Progress in the Construction of an Aerodrome, by Dr. Alexander Graham Bell; The First Annual

Aeronautic Cup Race, by Lieut. Frank Lahm; Experimental Flights with a Man-carrying Aeroplane by Israel Ludlow; How to Fly as a Bird, by John P. Holland; The Coming Dirigible Airship, by Capt. Homer W. Hedge; The Vertical Screw or Helicoptere, by Prof. William H. Pickering; The Balloon in Science and Sport, by A. Lawrence Rotch; A Balloon Trip from Cincinnati, Ohio, to South Carolina in April, 1861, by Prof. Thaddeus S. C. Lowe; A Flight over Paris, by William J. Hammer; Experiences of Traveling in a Balloon over Mountains and Rivers and Making A Safe Landing, by Augustus Post; Ballooning, by A. Leo Stevens; Critical Remarks on Progress, by Charles M. Manly; Aerial High Speed, by Prof. David Todd, Ph.D.; Experiments with Kite-sustained Aeroplanes, by William A. Eddy; The Use of Kites and Balloons in the U. S. Weather Bureau by Oliver L. Fassig, Ph.D.; Rubber Motors and Flying Machine Models; by William R. Kimball; The Direction and Velocity of Air Currents, by Chas. Fiesse; Propeller Testing Device, by A. M. Herring; The Law of Atmospheric Resistance of Wires and Rods, by Dr. A. F. Zahm; Discussion of Dr. Alexander Graham Bell's Paper, by A. F. Zahm; How I Became A Pilot, by J. C. McCoy.

Appendix: Rules and Regulations Governing the issue of Licenses for Aeronautic Pilots.

TREATISE ON MARINE GASOLENE ENGINES. By Francis G. Hall. *The Ferro Machine and Foundry Co., New York, 1907.*

ALUMNI RECORD OF SYRACUSE UNIVERSITY. 1835–1904. 2 Vols. *Syracuse, 1907.*

BULLETIN OF THE BUREAU OF STANDARDS, DEPT. OF COMMERCE AND LABOR, *Washington, 1907.*

REPORT OF THE COMMISSIONERS OF EDUCATION for the year ending June, 1905. Vol. 1. *Washington, 1907.*

NEW YORK STATE MUSEUM, BULLETIN 88 ZOÖLOGY. *Vol. 4.* Appendices 4 to 6, 1906.

CANDIDATES FOR MEMBERSHIP

Record of Qualifications, Engineering Experience and References

This list should be treated as confidential and is subject to inspection by members of the Society only. The names are those of candidates whose applications have been approved by the Membership Committee and the Council. The names appear in the same order as on the ballot sent to the voting membership, closing March 30, 1907.

TO BE VOTED FOR AS MEMBERS

DAVID FOWLER ATKINS, Omaha, Neb. Born: Westfield, Mass., Dec., 1869. Education: B. S., Worcester Polytechnic Institute, 1891. Apprentice: H. B. Smith Foundry Co., Westfield, Mass., 1886–1887. Drafting room: Chief Draftsman Harrisburg Foundry and Machine Works, 1891–1906, engines, boilers and complete power plants. Charge H. Speed engine design Armington Sims Eng. Co., Providence, R. I., 1897–1898. Designer, McIntosh, Seymour Co., Auburn, N. Y., 1898–1901. Shop experience: Chief Engineer Electric St. Railways, Rio de Janeiro, Brazil, S. A., 1896–1897. Inspector, mechanical and electrical engineer. Superintending Architects Office, U. S. Treasury Dept. Other engineering work: Development of full line of "Ideal," simple and compound engines with Harrisburg Foundry and Machine Works, 1891–1896. Development of speed changing device used on McIntosh & Seymour engines with alternators. Design of ventilating system, boiler room, U. S. Custom House, St. Louis. Present position: Inspector mechanical and electrical engineer, Office of Supervising Architect U. S. Treas. Dept.

References: J. E. Powell, J. F. McIntosh, J. A. Seymour, B. T. Allen, W. W. Bird, A. L. Rice.

FREDERICK W. BALLARD, 601 Canal Rd. N. W., Cleveland, Ohio. Born: Wilmington, Ohio, April 1869. Education: One year Cornell University, 1892–1893; B. S., Wilmington College, 1891, M. S., 1900. Apprentice: Johnstown, Pa., Steel Motor Co., Westinghouse Co., 1894–1896. Drafting room: Ohio Soldiers' and Sailors' Orphans Home, Xenia, Ohio, taught drafting for two years, 1900–1902. Shop experience: Machine shop and forge work in addition to having charge of all the engineering at the Home; taught steam engineering Central Y. M. C. A., Cleveland, Ohio, for three years. Other engineering work: 1891–1892, taught chemistry and physics in Martin Academy, Kennett Square, Pa.; 1893–1894, installation Ithaca Electric Ry., power house and other equipment. 1894–1896 installation engineer for Steel Motor Co., manufacturers of electric railway equip-

ment. 1896–1900, superintending Wilmington Elec. Light Plant. 1900–1902, Mechanical superintendent Ohio Soldiers' and Sailors' Orphans Home, Xenia, Ohio. 1902–1903, Associate Editor "The Engineer." Mechanical superintendent for the Sherwin-Williams Co.; designed and built complete paint factory, tin can factory, varnish factory and linseed oil mill at Montreal, Can.; zinc oxide smelter at Coffeyville, Kan., and varnish factory at Newark, N. J. Designed and built all their machinery, consisting of mills, mixers and other special apparatus, including tin can making machinery, having charge of maintenance and operation of all plants. Present position: Mechanical superintendent for The Sherwin-Williams Co.

References: Wm. T. Magruder, Arthur L. Rice, W. A. Harris, Geo. W. Galbraith, Henry M. Lane.

EMILE J. BAYLE, American Beet Sugar Co., Denver, Col. Born, Paris, France, May 1867. Education; Three and a half years Tulane University. Drafting room; Amer. Sug. Ref'g Co. New Orleans, La., 1893; La. Fur. Mfg. Co., 1894; John H. Murphy's Iron Works, in charge of drafting room, designing and supervising construction of sugar machinery, 1895–1906; New Orleans Boiler Works, 1896–1906. Shop experience; General direction and management of shop and field operations of Murphy's Iron Works and New Orleans Boiler Works, directing designing, construction and erection of structural work, boilers, sugar machinery, pumping plants, etc. Present position; Genl. engineer, American Beet Sugar Co., Denver, Col.

References; Warren Johnson, W. B. Gregory, A. M. Lockett, H. F. Rugan, H. J. Malochee, E. F. Jahncke.

JOSEPH ALBERT BENNETT, Hartford, Conn. Born: Lonsdale, R. I., October, 1865. Apprentice: Brown & Sharpe Mfg. Co., Providence, R. I., machinery, tools and fixtures, 1882–1885. Shop experience,: Brown & Sharpe, Mfg. Co., as foreman building machinery, 1885–1890. Pratt & Whitney's, 1890–1900, full charge of Gun Dept. Other engineering work: Own factory at Hartford, designed and made all special fixtures and tools for manufacturing the Ross Rifle, afterward manager of the Ross Rifle Factory, Quebec, Can., engineered erecting and starting of said plant. Present position: Representative for Niles-Bement-Pond Co.

References: F. C. Billings, B. M. Hanson, F. C. Pratt, C. W. Sponsel, Walter L. Clarke.

HARRY ZERA BIXLER, Youngstown, O. Born: Kendallville, Ind., September 1874. Apprentice: L. S. & M. S. Ry., Elkhart, Ind., 1895–1898, general repairs and reconstruction of locomotives. Drafting room: L. S. & M. S. Ry., Elkhart, Ind., 1890–1895. L. S. & M. S. Ry., Cleveland, O., Feb.–Aug., 1898. Carnegie Steel Co., 1898–1900, Youngstown, O. Carnegie Steel Co., New Castle, Pa., 1900–1901. Cambridge Rolling Mill Co., Cambridge, O., Sept.-Dec., 1901. Other engineering work: C. R. M. Co. had full charge construction of bar mill for rolling small bars, shapes, etc., from old rails. Dec., 1901, went to Republic Iron & Steel Co. at Youngstown, O., as draftsman. Chief Draftsman May, 1904, with full charge drawing room. Since Feb., 1905, complete charge of Engineering Dept. with the title of "Engineer" and responsible for the design and direction of boiler and electrical plants, hot metal mixers, soaking pits and various devices

used in rolling mills also a complete blast furnace plant. Present position: Engineer Republic Iron & Steel Co., Youngstown, O.

References: J. Weidman Murray, Louis A. Woodard, Charles B. Hunt, Irving H. Reynolds, Thomas J. Bray.

GEORGE HENRY BLAKELEY, South Bethlehem, Pa. Born: Hanover, N. J., April 1865. Education: B. S., Rutgers, 1884, C. E., Rutgers, 1894. Apprentice: Private engineering practice topographical surveys and the construction of roads and sewers, 1884–1886. Drafting room: Draftsman Riverside Bridge and Iron Works, Paterson, N. J., 1886–1888, designing and detailing bridges, buildings and iron structures. Other engineering work: Bridge Engineer for Erie R. R. in charge of bridge construction, 1888–1890. Chief Engineer Passaic Rolling Mill Co., and Passaic Steel Co., Paterson, N. J. 1890–1905, in charge of design and construction of open hearth furnaces, rolling mill machinery and special shop tools; charge of their structural department; in charge of design, manufacture and erection of steel railroad and highway bridges, structural steel work for buildings, draw bridge machinery, etc. Present position: Structural Engineer for Bethlehem Steel Co.

References: W. S. Ackerman, J. W. Ferguson, F. J. Gubelman, J. L. Harrington, Geo. A. Just, C. C. King.

JOSEPH H. BRADY, 1526 Campbell St., Kansas City, Mo. Born: Savannah, Ga., July 1854. Apprentice: Haxton Heating Co., Kewanee, Ill., 1872–1876, heating, ventilating and installing, engines, machinery, etc. Shop experience: Heating and ventilating of school buildings, Board of Education, Kansas City, Mo. From 1885 to the present time as Chief Engineer, preparing plans and specifications and superintendence of same. Other engineering work: Now preparing plans for the heating and power plant, new Manual Training High School, cost $400,000. Present position: Chief Engineer Board of Education, Kansas City, Mo.

References: F. R. Hutton, J. M. Kent, R. J. McCarty, W. G. Snow, W. L. Bronaugh.

HENRY BUKER, 16 Elton St., Providence, R. I. Born, Exeter, New Hampshire, November, 1873. Education: Graduate Phillips Exeter Academy, 1892; 3 years Rhode Island School of Design. Apprentice: Brown & Sharpe Mfg. Co., machinist's trade, 1892–1895; machine tools and in foundry. Drafting room: Brown & Sharpe Mfg. Co., 1898; Ritterhaus and Blecher, Barmen, Germany, designing tools and fixtures to increase product of factory. Shop experience: Brown & Sharpe Mfg. Co., 13 years, part of which time spent in their interest on the Continent. Other engineering work: Responsible position since 1901 in charge of small tool department, Brown & Sharpe Mfg. Co., Providence, R. I. Present position, responsible position since 1901 in charge of small tool department, Brown & Sharpe Mfg. Co., Providence, R. I.

References: Henry D. Sharpe, Wm. A. Viall, W. S. Locke, E. Rivell, Chas. R. Gabriel, L. D. Burlingame.

WILLIAM H. BURR, Columbia University, New York. Born: Watertown, Conn., July 1851. Education: Rensselaer Polytechnic Institute, C. E., 1872. Other engineering work: Active professional practice from 1872 to date, on

bridges, foundations, public works, five U. S. Government commissions including Isthmian Canal Commission. and professorship of engineering at Rensselaer Polytechnic Institute, Harvard University and Columbia University. Present position: Professor of Civil Engineering at Columbia University and consulting engineer to the Board of Water Supply; also expert engineer to Aqueduct Commission.

References: John Thomson, J. Waldo Smith, F. A. Goetze, Geo. W. Melville, W. H. Wiley, J. E. Denton.

FARLEY GRANGER CLARK, 4th and Front Sts., Long Island City, N. Y. Born, Palmer, Mass., July 1871. Education; 4 yrs. Wesleyan Academy, 1 year Mass. Inst. of Technology, 3 years Cornell University, special student in M. E. and E. E. Apprentice; Westinghouse Elec. & Mfg. Co., East Pittsburg, 1894, testing electrical apparatus. Drafting room: Designing generators and motors, Mather Electric Co., South Manchester, Conn., 1895. Other engineering work; Electrical Maintenance Co., New York, as inspector, 1896. Crocker, Wheeler Co., salesman, New York , 1896–1897. Metropolitan St. Ry. Co., New York, various positions in motive power department, 1897–1898. U. S. Army, Manila, P. I., Engineer Corps, 1898–1899. Metropolitan St. Ry. Co., New York, Electrical superintendent 96th St. Power Station, 1899–1903. Westinghouse, Church, Kerr & Co., New York, assistant electrical engineer, designing power and substations 1903–1905. Pennsylvania R. R. Co., superintendent power station, 1905. Present position, superintendent power station, mechanical and electrical engineering, P. N. Y. & L. I. R. R. Co.

References; T. N. Ely, W. C. Kerr, George Gibbs, C. W. Rice, G. B. Caldwell.

HOWARD E. COFFIN, E. R. Thomas Detroit Co., Detroit, Mich. Born, West Milton, Ohio, September, 1873. Education: 3½ years, University of Michigan. Apprentice: Olds Motor Works of Detroit. Drafting room: Drafting, designing, supervision of automobile and gas engine design. Shop experience: Work connected with automobiles and gas engine construction 1902–1905; Olds Motor Works, Detroit, management of the experimental department. Other engineering work: Chief engineer, Olds Motor Works, 1905–1906; vice-president E. R. Thomas Detroit company, 1906–1907; consulting engineer, E. R. Thomas Motor Company, Buffalo, N. Y., 1907; Chairman of Test Committee of Licensed Association of Auto. Mfrs. Present position, Vice-president Thomas Detroit Company; consulting engineer E. R. Thomas Motor Company; general engineering, director of design.

References: A. L Riker, J. R. George, Lucian C. Jackson, Wm. V. Lowe, R. L. Morgan.

HERBERT CHAPIN DAGGETT, 176 Federal Street, Boston, Mass. Born: Foxcroft, Maine, June 1867. Education: Massachusetts Institute of Technology, Boston, S. B., 1891. Drafting room, Swain Turbine Mfg. Co., Lowell, Mass., entire charge of their water wheel business, designing all of the work built by them during two years; doing all of the selling. Other engineering work: Entered the employ of the proprietors, Locks and Canals on Merrimack River, Lowell, Mass., until May, 1899, in mill-yard, penstock and raceway surveys, leveling for purpose of setting water gages, general drafting, computations of daily quantities used by the several mills, canal measurements, measuring and testing of water

wheels and miscellaneous office and field work. During the last four years with this company, field work, was in charge of party and in office, had charge during the absence of first assistant engineer. Summer of 1898, winter of 1898–1899, charge of some hydraulic work at Fairfield and Skowhegan, Maine; in Huntsville, Ala., 1899, surveys of land running levels and investigating water supply for Merrimack Mfg., Co., of Lowell, Mass. June, 1899, Marble Falls, Texas, report on water power of Colorado River. Holyoke Machine Co., 1901, Worcester, Mass., engineer and salesman, 2 years and design of the water wheel plants. S. Morgan Smith Co., of York, Pa., 1903, as New England Manager and engineer in charge of New England office. Present position: June, 1903, to present time, management of New England business, S. Morgan Smith & Co., designed practically all of the hydraulic power plants sold by this company, in New England during this time.

References: William L. Church, Howard L. Coburn, Frank B. Perry, C. M. Allen, John O. DeWolfe and Leonard Metcalf.

JOHN DARBY, 340 Springfield Ave., Summit, N. J. Born, Georgetown, D. C., May, 1867. Education: Stevens Institute of Technology, M. E., 1891. Drafting room: Draftsman in Ordnance Department, Washington Navy Yard, Aug.-Dec., 1891. Draftsman, Link Belt Engineering Co., New York, Jan.-Nov., 1892. Pope Mfg. Co., Hartford, Conn., 1898–1899, designing special machinery. Chief draftsman Harrisburg Foundry and Machine Works, Harrisburg, Pa., 1899–1901. Other engineering work: Partnership, H. W. Wolcott, designed many machines for various manufacturing concerns, covering envelope machines, drill presses, and machines for making special bicycle parts, 1892–1898. Engineer and office manager, Mackenzie, Quarrier & Ferguson, New York, 1901 to present. Designed power plants, Jersey Central Traction Co., Keyport, N. J., Parral Power & Reduction Co., Parral, Mexico; 23d Regiment Armory, Brooklyn; American Stone Co., Ravenswood, L. I.; Jersey City Printing Co.; Henry Bonnard Bronze Co., Mt. Vernon, N. Y.; New Jersey Freie Zeitung, Newark, N. J. Present position, Engineer and office manager, Mackenzie, Quarrier & Ferguson.

References: J. C. Jurgensen, F. E. Idell, B. T. Allen, H. A. Wolcott, C. F. Smith.

EDWIN RUST DOUGLAS, 324 Church St., Poughkeepsie, N. Y. Born, Brandon, Vermont, September, 1872. Education: Stevens Institute, M. E., 1893; Harvard, Sc. M., 1898. Drafting room: Howe Scale Co., Rutland, Vt., 1893–1895; Crocker, Wheeler Co., Ampere, N. J., 1898–1899. Other engineering work: Crocker, Wheeler Co., about a year on electrical design of motors and generators from 10 to 400 k. w. in connection with considerable preliminary mechanical design. About a year in laboratory as experimentalist; a year and a half in development and installation of a system of cost and stock keeping; work on factory equipment, covered mechanical and electrical features, machines, methods, cutting speeds, etc.; two years development and installation Crocker-Wheeler's multiple voltage system for factory driving, being closely connected with the plants of Wm. H. Trigg, Richmond, Va.; L. S. & M. S. Ry., Collinwood, Ohio. Pittsburg & L. E. Ry., near Pittsburg, Pa., and other plants; chief draftsman Crocker, Wheeler Co., 3 years; specifying engineer a short time. Present position, Mechanical superintendent, Adriance, Platt & Co.

References: Frederick V. Henshaw, Alex. C. Humphreys, Charles I. Earll, Bancroft G. Braine, F. De R. Furman.

WILLIAM ALBERT EDWARD DOYING, 24 State St., New York City. Born: Danville, Province of Quebec, Canada, June, 1867. Education: 2 years Stevens Institute class of 1890. Drafting room: Western Electric Co., Telephone switchboard work, Aug., 1896 to 1897. Metropolitan St. Railway Co., general engineering work 1897 to 1905. Shop experience: Machinist in Molding and Planing Mill for John C. Shaw, 1889–1890. Other engineering work: Doying Bros., Summit, N. J., 1891–1893. Supt. of erection of Hotel Beechwood and cottages for N. H. Cheeseborough, Summit, N. J., 1894–1896. Metropolitan Street Railway Co., 96th Street and Kingsbridge Power Station, acted as squad master, having charge of eight or ten men, checking all the drawings; work covered, laying out and details of water piping, steam piping, exhaust piping, circulating water piping, structural steel work, etc. In charge as checker, Amsterdam and 129th St. substation and car house. Bayard and Elizabeth Streets substation. 2d Ave and 65th St. substation. San Paulo Tramway Light and Power Co. for F. S. Pearson, Brazil, acted as checker on general station and step down station, laying out all plans, covering turbines, generators, switch boards, wiring, masonry work and structural work. Present position: Assistant Inspector for Isthmian Canal affairs, having charge of all inspectors of materials, machinery etc., for the construction of the canal and railroad.

References: Jas. D. Andrew, W. H. Bristol, Ernest L. Broome, James Craig, Geo. A. Orrok, F. S. Pearson.

LARS MAGNUS EKSTRAND, American Steel & Wire Co., Waukegan, Ill. Born: Sweden, 1864. Drafting room: In charge of drawing room at Waukegan Mill, American Steel & Wire Co., 1900–1904. Foreman pattern maker, charge of drafting room, making all kinds of engine, boiler and pump tests and looking after engineering matters generally in connection with rolling mill work and wire producing machinery. Shop experience: Charge of pattern making at Waukegan mill, 1892–1897; in charge of construction at the same mill for the American Steel & Wire Co., 1898–1904. Estimating cost, installing various kinds of mill improvements and savings to be effected by such installations. Present position: Since 1903, Engineer Chicago District, American Steel & Wire Co.

References: David B. Carse, J. B. Carse, F. H. Daniels, W. G. Starkweather, A. F. Backlin, W. E. Snyder.

WALTER FERRIS, 710 Prospect Ave., Milwaukee, Wis. Born, Rancocas, N. J., March 1868. Education; Lehigh University, M. E., 1895. Apprentice; The Moore & White Co., Philadelphia, Pa., paper making machinery 1885–1889; six months during apprenticeship on detailing paper machinery. Drafting room; Master mechanic's office Pencoyd Works, July–Dec., 1895; Bucyrus Co., designer on heavy railway cranes, 1902–1903; chief draughtsman, 1903–1905; assistant chief engineer, 1905 to date. Shop experience; Link Belt Engineering Co., toolroom, 1889–1900; in charge of erection of coal handling plant until January, 1901, then in charge of tool room until August, 1901. Other engineering work; mechanical engineer for Laflin & Rand Power Co., in charge of design and erection of powder mills, 1895–1897; assistant master mechanic Pencoyd Iron Works, in charge of steam plant, including operation and maintenance of boilers, engines, hydraulic machinery, 1899; 1899–1902, conducted hydraulic experiments and design of improved forms of Venturi meters; original design work incorporated in various machines built by the Bucyrus Company. Present position, assistant

chief engineer, the Bucyrus Co., general supervision of design of dredges, steam shovels, wrecking cranes, pile-drivers, etc.

References; James M. Dodge, James Christie, S. L. G. Knox, S. Howard-Smith, Joseph S. Klein, and David T. Jones.

JOHN M. FLANNERY, 1628 West Genesee St., Syracuse, N. Y. Born, New York, August 1862. Apprentice; P. F. Hannon, Spracuse, N. Y., 1878–1883. Drafting-room; The Solvay Process Company, Syracuse, N. Y., 1890–1895; designing mill buildings, structural work, and general apparatus for manufacture of chemicals. Shop experience; Building contractor, Syracuse, N. Y., 1883–1890; erected a number of houses, some church work, mill work, charge of erecting foundry, building and installing machinery at works of Porter Mfg. Co., Syracuse, N. Y., installation of machinery in the old salt works. Other engineering work; Solvay Process Company, 1890 to present; 5 years of time in drafting room. Assistant to the purchasing engineer, T. S. P. Co. and Semet-Solvay Co., since 1895; preparing specifications from original drawings, placing same in hands of contractors, and placing orders for material. Includes all kind of structural work, special machinery and apparatus, castings, engines, pumps, boilers, tank work, etc., while employed by T. S. P. Co., acted as architect and engineer, designing and installing foundry plant for Reddin Iron Works, and rolling mill for Eckel, Nye Steel Company, Syracuse, N. Y.; designed and looked after erection of large number of other buildings for various purposes. Present position, assistant to purchasing engineer, Solvay Process Co., and Semet-Solvay Co.

References; Wm. S. Cogswell, John E. Sweet, Geo. G. Fryer, Chas. L. Griffin, Chas. Piez, A. R. Gillis, Barton Cruiksbank.

HARRY TERBOSS GOSS, 76 William Street, New York. Born, Philadelphia, Pa., October 1871. Education, Worcester Polytechnic Institute, B. S., 1894. Drafting room; Dexter Folder Company, Peral River, N. Y., 1894–1895; D. H. Hayward, N.Y., 1895-1901, chief draftsman, 1901, entire charge of drafting department. Shop experience; Washburn Shops at Worcester, Mass. Other engineering work; three years to present time under the firm name of Goss and Bryce, general engineering and machine design, supervising construction work, consulting engineering inspection and reports on plants and structures with a view to betterments including the mechanical drafting incidental thereto. Present position, Partner, Goss and Bryce, consulting mechanical engineer.

References: D. Howard Hayward, Percy A. Sanguinetti, F. J. Bryant, E. W. Marshall and A. W. Howe.

JOHN HARPER, Western Electric Company, Chicago, Ill. Born, Mintlaw Station, Scotland, September, 1874. Education: Four years Robert Gordon's College, Aberdeen; certificates from Science and Art dept. of So. Kensington, also City and Guilds of London Institute. Apprentice: With Great North of Scotland Ry. 5 years, as follows: Machinist in locomotive shops, 1 year, 11 months; electrician, assistant to engineer in charge of electric light station 10 months; repairman and lineman in the telegraph department 9 months. Drafting room: In office of engineer in chief, architects department, G. N. S. Ry. Co., 1 year, 6 months, 1896–1898; Northwestern Telephone Exchange Company, Minneapolis Minn., 1898–1901; transferred from N. W. Telephone Exchange Co. to Michigan as draftsman and then to Wisconsin; later in the same year engineer of construc-

tion department; Michigan Telephone Company, Detroit, Mich., and the Wisconsin Telephone Company, Milwaukee, Wis.; Western Electric Company, Chicago, Ill., 1901 to present. Shop experience: Machinist in locomotive shops G. N. S. Ry. Co., 1 year, 11 months. Draftsman and chief draftsman on manufacturing drawings. Valuable shop experience has been derived during the last five years. Other engineering work: Charge of drawing offices in Milwaukee and Detroit as well as direct charge of all underground construction crews; made drawings and superintended the construction of a tunnel under and across the Milwaukee River; Western Electric Company, 1901, as draftsman, 1902, foreman switchboard work, 1905, chief draftsman of all telephone work. Present position, Chief draftsman Western Electric Company, Chicago.

References: Harmon M. Sage, G. M. Campbell, D. A. Wallace, C. P. Wetmore, H. F. Albright.

GRANVILLE A. HARRIS, 60 Wall Street, New York. Born, Elizabeth, N. J., December, 1874. Education: Four years Stevens Institute, Hoboken, N. J. Apprentice: On board steam yacht "Theresea" as fireman, oiler and engineer, 1893, 1894 and 1895. Drafting room: Engineer steam yacht "Josephine," March to October 1897. Engineer Morgan Line, 1896–1897. Shop experience: in charge of erection and operation of engines, Waclark Wire Works, Elizabeth, N. J., 1897–1898. Chief gunner's mate and electrician U. S. S. "Vixen" during Spanish-American war, April to December, 1898. Other engineering work: Constructing engineer, Westinghouse Elec. & Mfg. Co., 1898–1901, entire charge of erection of numerous power stations and industrial plants. Engineer Takata & Co., April, 1901, to present time, entire charge of engineering department, designing, buying, erection of most of the power plants, and other engineering work in Japan and China, such as Imperial Steel Works, mills—Kure Arsenal, Furnaces, Tokio Elec. St. Co., Power Sta., heating and refrigerating installations, etc. Present position, Chief Engineer Takata & Co., active charge of engineering department.

References: Clarence S. Taylor, E. D. Meier, Walter McFarland, Maurice Coster, Spencer Miller.

ROBERT JOSEPH HEARNE, 12 Wooster St., New York City. Born: Dublin, Ireland, 1865. Apprentice: Office and technical work with John Thornton & Co., New York, sewing machines, 1880–1885. Drafting room: With own concern 19 years, Dubrow & Hearne Mfg. Co., New York. Shop experience: Dubrow & Hearne Mfg. Co., in charge of manufacturing and designing machinery. Other engineering work: Charge Dubrow & Hearne Mfg. Co., New York, designing and manufacturing of sewing machines, small machinery, power transmission. Present position: Secretary and Treasurer of Dubrow & Hearne Mfg. Co.

References: Geo. S. Humprheys, F. A. Halsey, R. F. Frevert, Henry D. Sharpe W. A. Viall, C. W. Hunt.

ERNEST ROWLAND HILL, 10 Bridge St., New York. Born, Pompton, N. J.. January 1872. Education: M. E. Cornell University, 1893. Shop Experience: At works of Western Electric & Mfg. Co., Pittsburg, Pa., two years, various departments; including mechanical and electrical, inspection and supervision of all work done on machines of 100 to 5000 h. p., 1893 to 1895. Other engineering work; 1895 to 1901, special engineer of the W. E. & M. Co., on development of

heavy electric traction apparatus, tests and experimentation; under direction of Mr. Geo. Westinghouse developed the Westinghouse electro-pneumatic system of train control and invented a number of improvements in same; worked up electric traction, power and other engineering projects and general engineering work. Engineer-in-chief of the British W. E. & M. Co., 1901–1906, London, England, in charge of all electric, steam, mechanical and civil engineering work of that company in connection with the conversion of steam railways to electric at the Mersey Railroad, Liverpool, Metropolitan Ry. & Dist. Ry., London, and in connection with power supply companies, such as the Clyde Valley Electric Power Co., and similar engineering for British Westinghouse Company, for all proposed and projected undertakings. Present position, Asst. to chief engineer electrical traction, Penn. R. R. and associated with Mr. Geo. Gibbs, the chief engineer of electrical traction and engaged in conducting and directing electrification of the New York tunnels and terminal work in connection with design and construction of power houses, services of all kinds for terminal station, yard, track, line and cable equipment, electric locomotives and steel cars; lighting, signals, etc.

References; Geo. Gibbs, Geo. Westinghouse, Walter C. Kerr, Theo. N. Ely, L. R. Alberger.

R. CLAUDE HOLMAN, Hooven, Owens & Rentschler Co., Hamilton, O. Born, Summerside, P. E. Island, Canada, April, 1873. Education: B. A. Sc. McGill University, 1893. Drafting room: E. D. Leavitt, Jr., 1896; Southwark Foundry and Machinery, 1900–1904. Shop experience: C. P. R. Shops, Montreal. Other engineering work: Rice & Sargent Engineering Co., designer on layout of engines, vertical engine, Lincoln Wharf Power House of West End St. Ry. Co., Boston, 1894–1896; McIntosh, Seymour & Co., charge of engine design and superintending construction, 1896–1899; designer Hamilton four valve engine, Hooven, Owens & Rentschler Co., Hamilton, O. Present position, Chief draftsman, Hooven, Owens & Rentschler Co.

References: Wm. B. Mayo, Jas. A. Seymour, Harte Cooke, Richard H. Rice, Carl A. V. Carlsson.

F. AMOS JOHNSON, 143 Liberty St., New York City. Born: West Spring Creek, Pa., June 1861. Education: University of Minnesota, B. S., 1886. Drafting room: Eighteen years experience in designing and shop superintendence. Shop experience: Johnson-Crane Matrix Co. of Minnesota; Tachytype Mfg. Co., of Minn., at Philadelphia; The Johnson Typesetter Co., of Maine, with factory at New Bedford, Mass.; part of the time general manager; mechanical superintendent full charge of the drafting room and factory, building machines of own design 1887 to 1903 successively. Other engineering work: For the last three years full charge of the experimental department of the Unitype Co., of Brooklyn. Present position: Consulting engineer and mechanical expert, designing for clients, patent expert work.

References: John H. Barr, Herbert E. Cushman, Charles R. Murray, George R. Stetson, Walter S. Timmis.

JOHN EMLYN JONES, Engineers Club, 32 W. 40th St., City. Born, Toronto, Canada, January, 1873. Education: Toronto University, Toronto, Graduate Engineer, Class 1894. Drafting room: Cambria Steel Company, 1898; National

Steel Company, 1899. Shop experience: Mesta Machine Company, Pittsburg, Pa., 1902. Other engineering work: National Steel Company, Youngstown, O., charge of steel contract construction, 1900. Wellman, Seaver, Morgan Company. Cleveland, O., charge of department of rolling mill design, 1901. Mesta Machine Co., Pittsburg, Pa., contracting engineer, 1902–1903. H. M. Treadwell & Co., New York, contracting engineer, 1904–1905. National Metallurgic Company, New York, chief engineer, 1906. Present position, National Metallurgic Company, New York, chief engineer, 1906.

References: C. W. Bray, Albert Ladd Colby, F. M. Bowman, H. O. Pond, W. A. Harris, J. H. Jowett, Wm. Gleason.

JOHN HENRY KLEPINGER, Great Falls, Montana. Born, Brooktons, Ind., 1871. Education: Purdue University, B. M. E., 1893. Other engineering work: Assistant instructor, engineering laboratory, Purdue University, 1893–1897. Draftsman Link Belt Machinery Company, Chicago, 1897–1900. Boston & Montana C. C. & S. M. Co., at their reduction works at Great Falls, Montana, since 1900. Present position, Assistant master mechanic, Boston & Montana Con. Copper & Silver Min. Co.; for past three years engaged in making special tests on the waste gases from the smelter, investigating draft conditions, and in designing a system of new flues, dust chamber and chimney.

References: C. H. Redpath, Wm. Wraith, S. B. Peck, W. F. M. Goss, M. J. Golden.

MORRIS KNOWLES, Bureau of Filtration, Pittsburg, Pa. Born: Lawrence Mass., October 1869. Education: S. B., Mass. Institute of Technology, 1891. Apprentice: Essex Co., Lawrence, Mass. Occasional periods, 1887–1889. Manufacturers Mutual Fire Insurance Co.'s, vacation periods, 1890–1891, surveyor and draftsman. Other engineering work: Assistant engineer, East Jersey Water Co., Montclair, N. J., 1891–1893. Assistant engineer, Massachusetts State Board of Health, Boston, Mass.; charge of office investigations upon Metropolitan Water Supply for Boston and vicinity, 1893–1895. Assistant engineer, Metropolitan Water Board, Boston, Mass., charge of special office work, 1895–1897. Resident engineer, Pittsburg Filtration Commission, Pittsburg, Pa., charge of experiments and investigations in regard to purification of and additional water supply, 1897–1899. Assistant engineer, investigation, Philadelphia Water supply, 1899. Assistant engineer, New York water supply, 1899–1900. Assistant engineer in charge testing station water supply, Philadelphia, 1900–1901. Resident engineer, charge preparing plans and estimates for slow sand filter plant, Pittsburg. Firm, Chapin & Knowles, consulting engineer, 1901–1903. Present position: Chief Engineer, Bureau of Filtration, Pittsburg.

References: John R. Freeman, J. Waldo Smith, William C. Coffin, Chester B. Albree, W. A. Bole, G. F. Swain, C. T. Main, W. E. Parker.

EDWARD JOSEPH KUNZE, 52 Parkhurst St., Newark, N. J Born, Newark, N. J., March, 1875. Education: Cornell University, 1901, M. E., also post graduate work. Apprentice: Charles Kunze, tool and die making, also light machinery, 1889–1894, the foreman of tool makers. Drafting room: De La Vergne Machine Company, New York, 1901–1904; charge of the refrigerator plant details, condensers, reboilers, freezing tanks, etc. Shop experience: Small machine parts, large machine operation, floor work, and also plant erection, De La

Vergne Machine Company, June to October, 1889. Other engineering work: York Mfg. Co., of York, Pa., 1898, erecting machinist in installing ice machinery. Made up a line of improved grease separators; charge of the cranes and hoists and made new design of these; finally had charge of the design and construction of oil engines, and during the absence of the manager, assumed charge including the commercial end. 125 h. p., 1½ h. p. oil engines designed; 15 h. p. vertical model 2 cylinder oil engine redesigned and altered. Present position: Consulting mechanical engineer, covering general power plant work, and design of internal combustion engines and apparatus connected therewith; one of the inventors of Illmer, Kunze Gas Engine System, for large powers; at present designing 2 cycle gasolene engines for auto-truck for Wm. Hangliter of Newark; power, lighting and heating plant for Kaufherr & Co., Newark; putting in a new fuel feeding and consuming apparatus for the annealing ovens and reverberatory furnace, American Malleable Company, Bloomfield, N. J.; laying out a system for utilizing certain cooling water, for the dry color process used in printing ink manufactured at the works of Sigmund-Ullman Co., New York.

References: Albert W. Jacobi, Geo. L. Hoxie, R. C. Carpenter, A. W. Smith, John H. Barr.

CHARLES J. LARSON, Allis-Chalmers Company, 71 Broadway, New York, Born, River Falls, Wis., March 1872. Education; Rose Polytechnic Institute. B. S., 1900. Other engineering work; Erecting engineer, Allis-Chalmers Company, 1900–1906, superintended the installation of a large number of steam power units; installed and had charge of operation of the 6000 horse power Allis-Chalmers-Bullock exhibit at the St. Louis Exposition, 1904. Present position, district superintendent of erection, Allis-Chalmers Company since Jan., 1906. General supervision of installation, operation, and testing of machinery furnished by the Allis-Chalmers Company in Eastern territory, comprising about 10 states; includes complete steam engine, steam turbine, gas engine and hydraulic, power plant installation; also pumping, crushing, mining and electrical machinery.

References; John T. Wilkin, Edw. T. Adams, Chas. J. Davidson, Thos. Gray, Frank C. Wagner.

BURNS DANIEL LOCKWOOD, 2403 Park Ave., Indianapolis, Ind. Born, Buffalo, New York, October, 1867. Education: Three years Heathcote Academy, Buffalo. Apprentice: C. N. O. & T. P. Shops, Ludlow, Ky., general work; all classes of mechanical and steam engineering work. Drafting room: Fifteen years, Ludlow, Ky., C. N. O. & T. P. Ry., 1887–1893. Cincinnati, O., experimental engineering, 1893–1896. C. C. C. & St. L., Indianapolis, chief draftsman, 1897–1904, mechanical engineer, 1904 to date. About four years general service with the above companies. Present position: Mechanical engineer, C. C. C & St. L. R. R., general charge of steam and electrical equipment selection and maintenance including shop design and construction.

References: Theo. Weinshank, J. R. Whittemore, Hugo Diemer, Chas. H. Hurd, Wm. M. Taylor.

ARTHUR GLENN McKEE, 514 Rockefeller Bldg., Cleveland, Ohio. Born; State College, Center Co., Pa., Jan. 1871. Education; Penn. State College, B. S., M. E., 1891–1899. Drafting room; H. C. Frick Coke Company, 1895–1896, Carnegie Steel Company, 1896–1898; charge of drawing room work, Ohio Steel

Company, 1892–1899. Shop experience; Charge of blast furnace dept., Julian Kennedy, 1899–1900; charge of the design and construction of No. 5 furnace, American Steel & Wire Co., Cleveland, Ohio, and Neville Island Furnace. District engineer, American Steel & Wire Co., 1901–1905, charge of the power plants and various parts of mill equipment as well as the complete rebuilding of furnaces, 1, 2, 3 and 4 with their ore handling and other equipment. Consulting and contracting engineer, Cleveland, Nov. 1, to present time. Other engineering work; 1906–1907, consulting engineer and contraction engineer in charge of the design and construction of the furnace plant of the Inland Steel Company, Indiana Harbor, Ind., and the furnace plant of the Perry Iron Company, at Erie, Pa. Present position, consulting and contracting engineer, design and construction of blast furnace and mill equipment.

References; F. H. Daniels, Samuel T. Wellman, A. F. Backlin, C. R. Hinchman, L. E. Reber.

EDWARD BYRON McKINNEY, 5527 Atlanta St., New Orleans, La. Born New York, N. Y., February 1854. Apprentice; Delamatar Iron Works, New York, 1870–1874; ocean merchant service as engineer, 1874–1897; erecting mining machinery in California, 1879–1882; chief engineer of ocean steamers out of port of New York, 1882–1889. Other engineering work; chief engineer La. Elec. Light Co., New Orleans and other plants owned by them, 1889–1895; appointed chief engineer St. Charles St. R. R. Co.'s power house, 1895; chief engineer N. O. Traction Co., 1897, holding both positions until 1902; superintendent of power Railway Co., in charge of eight plants, 1902 to date; planning of power plants and installation of machinery. Present position; Supt. of power New Orleans Railway & Light Co.

References: Lewis Johnson, Irving H. Reynolds, James W. Lyons, Warren Johnson, William H. Hume.

FREDERICK JOSEPH McMAHON, 402 South River St., Wilkesbarre, Pa. Born: Brooklyn, N. Y., August 1870. Education: Pratt Inst., and four years Cooper Union. Apprentice: Various shops, tool, nail, electric motor and railroad machinery, 1886–1890. Drafting room: American Type Foundry Co., six months; Susquehanna Coal Co., New York, 1886–1887. Sprague Electric Co., Edison & General Electric at New York and Lynn, 1890–1893. Int. Conduit & Insul. Co., New York, 1893–1894. Shop experience: Albert Nail Co., New York, 1886–1887. E. W. Bliss & Co., Brooklyn, N. Y., six months. C. A. Lieb, New York, specialist, 1887–1888. Sprague Electric, 1888–1889. Other engineering work: Experimental work for Interior Conduit & Insulating Co., in railroad motors and fans. Designing of colliery for coal preparation and haulage installations for coal handling, also charge of maintenance and operation of mechanical equipment of mines of Susquehanna Coal Companies. Present position: Division Mechanical Engineer Susquehanna Coal Companies.

References: R. V. Norris, Chas. Piez, E. H. Jones, S. T. Nicholson, H. H. Morrison, C. A. Straw.

F. M. METCALF, 99 Fremont St., Battle Creek, Mich. Born: Grand Rapids, Mich., Sept. 1857. Apprentice: Machinist, Battle Creek, Mich., Upton Mfg. Co., 1881–1883, construction and erection of steam engines. Drafting room: Battle Creek Steam Pump Co., 1890–1899, American Steam Pump Co., 1899–1906.

Shop experience: Upton Mfg. Co., 1881–1884. Advance Thresher Co., 1884–1888; Battle Creek Machy. Co., 1888–1890. B. C. Steam Pump Co., 1890–1899. Other engineering work: Charge erecting floor, steam engines, advance, 1884–1888. Charge experimental work pumping machinery, 1890–1899. Charge engineering department, American Steam Pump Co., 1899–1906. Taken out patents on method manufacturing piston rings; steam engine fluid valve; steam valve; air compressor valve; pneumatic tool. Present position: Mechanical engineer of American Steam Pump Co.

References: T. E. Morford, A. W. Howe, W. T. Wheeler, Thure L. F. Larsson, F. W. Wolf.

CHARLES MILLS, Saco and Pettee Machine Shops, Newton Upper Falls, Mass. Born, Lancashire, England, April 1852. Education; Government science schools six years. Apprentice; F. & D. Mills, Haywood, England, textile machinery, 1867–1885, machine work, patternmaking, designing cotton machinery, and special tools for manufacture of same. Drafting room; Howard & Bullough, England, 1885–1889. Shop experience; John Whiteley and Sons, Halifax, Eng., superintending installation of textile machinery. Other engineering work; superintendent Saco and Pettee Machine Shops, Newton Upper Falls, Mass., Jan., 1893 to date, inventing and improving textile machinery; inventing and designing special tools for the manufacture of the same. Originated special forms of milling and turning or forming machines. Present position, superintendent of works, Saco and Pettee Machine Shops being responsible for the efficiency of the product and for its economical manufacture.

References; Peter Schwamb, Chas. H. Manning, Louis E. Harper, Fred A. Wallace, Frank H. Robinson.

FRED ELMER NORTON, The William Tod Co., Youngstown, Ohio. Born, Du Quain, Ill., September 1869. Education: Mass. Inst. Tech., S. B., 1891. Drafting room: Edward P. Allis Co., Milwaukee, 1892–1892; designing and outside expert work. Shop experience: Edw. P. Allis Co., erecting and expert work on steam engines, pumps, and general machinery. Other engineering work, Testing for Edward P. Allis Co., Alpha Dredge, Miss. River Commission, Detroit: 25 million gal. Boston sewage pumps; South Africa, E. P. Allis, 1895; engineer for Sehriff-Swingley, Johannesburg, So. Africa, 1895–1904, general mining machinery, in charge of design and erection of all classes of steam, air and hydraulic machinery; engineer Wellman-Seaver-Morgan Co., Cleveland, O., 1904–1905. Present position, Chief engineer William Tod Co., Youngstown, O., designing and building heavy rolling mill engines, blowing engines, gas engines and special machinery.

References: Gaetano Lanza, Irving H. Reynolds, S. H. Pitkin, F. C. Moore, P. Kirkevaag.

WARREN BETTISON REED, 1013 Hibernia Bldg., New Orleans, La. Born, Louisiana, April, 1871. Education: Tulane University, S. B., 1891. Other engineering work: Edison Electric Illuminating Co., New Orleans, in charge of meter department; patent on Thompson Watt Meter and sold same to General Electric Co., 1891. Assistant superintendent, 1892–1893; in construction business putting up plants, etc., 1893–1896; engineer, Underwriters Bureau, New Orleans, took out series of patents on electrical system of distribution, 1895–1897; city electrician, installed present fire alarm system, New Orleans, six months;

organized the Safety Electric Mfg. Co., manufacturing switchboards, miscellaneous machinery, and installed plants, 1898; District manager, Wagner-Bullock Co. with Louisiana, Mississippi and Texas for territory, two years; Managua, Nicaragua, installed electric plant, 1901, managed same for two years; installed new mills, lime kilns. Present position; consulting engineer with staff of ten engineers; consulting, mechanical and civil work; consulting engineer for the Consumers Electric Co., New Orleans, a large lighting plant; Franklin, La., new plant; New Orleans Lake Shore Land Co., large pumping plant for drainage; Equitable Real Estate Co., electric plant, heating, wiring for all their buildings; New Orleans Cotton Exchange, pumping, elevators, and heating; Atchafalaya Bay Ship Channel Co., dredging ship channel.

References: W. B. Gregory, Alfred Raymond, Henry J. Malochea, A. M. Lockett, Henry F. Rugan.

ROBERT C. REID, Englewood, N. J. Born, Rondout, N. Y., July 1876. Education; One year Pratt Inst., Brooklyn, N. Y.; three years Cooper Institute, New York, N. Y. Apprentice; R. Hoe & Co., Manufacturing printing presses 1892. Drafting room; R. Hoe & Co., 1895–1898. American Sugar Refining Co., 1899–1900. N. Y. Glucose Co., 1900. Shop experience; R. Hoe & Co., 1892–1895. Erie R. R. Repair Shops, Jersey City, one month 1891. Other engineering work; Designed 3600 h. p. boiler and engine plant for American Sugar Refining Co., and other machinery and buildings. Designed mill buildings and 4000 h. p. boiler plant N. Y. Glucose Co., Shadyside, N. J. Present position, Manager Chapman Valve Mfg. Co., New York agents.

References; E. D. Tucker, H. O. Pond, John W. Loveland, W. S. Timmis, J. W. Robinson.

GEORGE WILLIAM ROUVEL, La Salle, Ill. German American Portland Cement Works. Born: Marine City, Michigan, July 1875. Education: B. S., Case School of Applied Science, 1900. Other engineering work: Aug.–Dec., 1900, Draftsman Reliance Machine Co., Supt. Construction Crown Dryer Co., Cleveland, 1901. Constructing Engineer and Draftsman Wellman-Seaver-Morgan Co., 1902-1903. On cement and steel plants. Mechanical engineer and assistant superintendent Sandusky Portland Cement Co., 1904. Present position: Supt. German American Portland Cement Works.

References: Claude E. Fitch, Norman D. Fraser, H. A. Allen, Harold McGeorge, John McGeorge.

VERNON ROYLE, 618 East 28th St., Paterson, N. J. Born, Paterson, N. J., June 1846. Apprentice; Wm. G. & J. Watson, machinists, general pattern work and special jobbing, 1864–1868. Drafting room; original designing of machines, 25 years, John Royle and Sons. Shop experience; Several years at special bench and machine work, John Royle having entire charge of the firm's machine designing, 1877 to date. Other engineering work; original designing and personal supervision of construction of routers, lining-bevelers, and machines of related use for photo-engraving, repeaters, lacers, and other Jacquard card machinery; rubber tubing machines, and machines for seamlessly insulating electric wire and cables. Work covers a period of 30 years at John Royle and Sons. Present position, president and treasurer of John Royle and Sons.

References: Wm. W. Christie, Elmer H. Neff, J. V. Ferguson, Thos. H. Milson, Fredk W. Cooke.

HENRY FRANCIS SCOTT, So. Framingham, Mass. Born: Brocton, Mass., August 1876. Education: S. B., Mass. Institute of Technology, 1898. Shop experience: Geo. V. Scott Machine Co., Brocton, Mass., 1890–1898, pattern making, general machine work, and designing. Other engineering work with Denison Mfg. Co., 1898–1899. Original design for tag stringing machine, and variety of special machines, in connection with mill engineering, new buildings, laying out of departments, changes in power plant, etc.; experimenting upon new methods of manufacturing, and investigating new process of doing work. Present position: Mechanical engineer having supervision of all engineering work, Dennison Mfg. Co., 1900 to date.

References: Gaetano Lanza, Eugene W. Rutherford, Howard L. Coburn, Frank S. Tucker, Chas. A. G. Winther.

COLIN C. SIMPSON, 4 Irving Place, New York. Born, Maidstone, England, December, 1856. Education: Two years Technical High School, Gratz, Austria, one year Naval Academy, Trieste, Austria. Other engineering work: Charge of the laying of mains of the water system of Vienna, Austria; invented a tapping machine for tapping mains while under pressure without allowing the water to escape; for seven years branch superintendent of mains, Consolidated Gas Company, general superintendent of distribution for the last 18 years, Consolidated Gas Company, New York, having the entire charge of the distribution system, improvements and betterments of same; planned and supervised the laying of the 60 inch main from Astoria plant to Ravenswood; planned and supervised the laying of the 24 inch submerged main under the Harlem River Ship Canal at Kingsbridge which has been in successful operation for the last 12 years. Present position, General superintendent of distribution of the Consolidated Gas Company, New York, and consulting engineer of affiliated companies.

References: Alex. C. Humphreys, J. W. Lieb, Jr., A. E. Forstall, Wm. H. Bradley, A. J. Frith.

MARTIN OTIS SOUTHWORTH, Fairbanks, Morse & Co., Chicago, Ill. Born, Stoughton, Mass., November 1869. Education; Massachusetts Institute of Technology, S. B., 1890. Apprentice; Thomson Houston Electric Company, Lynn, Mass., 1890, testing and assembling electrical machinery. Drafting room; Designing and drawing electrical machinery for Commercial Electric Company, Indianapolis. Shop experience; Luther Southworth, Stoughton, Mass, two years on shoe counter machinery. Other engineering work; assistant engineer in power and and mining dept. of General Electric Company, 1890–1894, charge of testing special motors and allied apparatus and design of small motors and their applications. 1894–1906, chief engineer of the Commercial Electric Company in charge of design and construction of outside construction work. Designed dynamos and motors up to 500 k.w. Present position, electrical engineer, Fairbanks, Morse & Co., assistant to the manager of the electrical department in an engineering and executive capacity.

References; J. A. Charter, Calvin W. Rice, Hugo Diemer, J. B. Blood, E. M. Hewlett, R. C. Stevens.

FRANK SUTTON, New York City. Born: New York City, December, 1874. Education: E. E., Columbia University, 1895. Other engineering work: En-

gaged in designing, electrical, heating and ventilating plants also Sprinkler & Fire Protection Work. Consulting engineer of the following: Essex Co. Hospital for the Insane, Overbrook, N. J., ; National Soldiers Home, Washington, D. C.; Nat. Home D. V. S. Marion, Ind.; Fordham Hospital; Harlem Hospital; Gouverneur Hospital; Manhattan Eye, Ear and Throat Hospital, Brooklyn Carnegie Libraries, Brooklyn, New York, N. Y. Atlantic Terminal Depot, Atlanta, Ga. The Arlington Co., Arlington, N. J. Hammerschlag Mfg. Co., Garfield, N. J. American Dock Stores, Tompkinsville, S. I., etc. Present position: Consulting engineer, electrical and mechanical.

References: David H. Darrin, Frank E. Idell, B. P. Flint, J. A. Almirall, Henry Torrance, Jr.

CHARLES E. SWEET, care The Westinghouse Machine Co., East Pittsburg, Pa. Born, Rockland, Mich., August 1870. Apprentice; Portage Lake Foundry & Machine Co., 1889–1892. Shop experience; Clyde Iron Works, Duluth Minn., 1892–1893. Diamond Match Co., Ontonagon, Mich., to 1894. Gisholt Machine Co., Madison, Wis., 1894–1896. Other engineering work; machinist and foreman of the lathe department, machine tool erector, expert and salesman, Walter H. Foster, New York, to Jan., 1901. Russell & Irwin Mfg. Co., New Britain, Conn. 1901–1902; general foreman of machine department, De Laval Steam Turbine Co., Trenton, N. J., three months. Present position, The Westinghouse Machine Co., East Pittsburg, Pa., 1902 to date, superintendent steam turbine construction.

References; Henry L. Barton, Wm. A. Bole, Frank H. Robinson, E. S. McClelland, H. E. Longwell.

ROBERT BARNARD TALCOTT, 427 Fifth Ave., New York. Born: Richmond, Va., December, 1863. Drafting room: Washington, D. C., Edward L. Dent & Co., designing layout and superintending heating and ventilation work, 1888–1890. Designing, preparing drawings and specifications for heating power plants and elevators, office of supervising architects, treasury department, 1890–1899. Other engineering work: Supervising the preparations of plans and specifications for mechanical equipment of public building as heating engineer, 1899-1904; similar work with added administrative work as assistant chief mechanical electrical engineer,; U. S. Department of Agriculture, Jan., 1904, to date. Also consulting mechanical engineer in connection with power plant for U. S. Soldiers Home, Washington, D. C., and the "Walter Reed," U. S. Army General Hospital, Washington, D. C. Present position: General Manager of the Vacuum Cleaner Co., of New York, 1907.

References: J. E. Powell, H. Hollerith, H. Adams, H. Webster, W. W. Sayers.

LUCIUS MORTON WAINWRIGHT, Indianapolis, Ind. Born: Noblesville, Indiana, January 1860. Drawing room: Designer and manufacturing superintendent of Central Cycle Mfg. Co. Other engineering work: 1888–1890, charge of construction Ohio Oil Co., Lima, O. Pipe Line Dept. 1890, organized Central Cycle Mfg. Co., Indianapolis, designed and manufactured bicycles until 1898. Appointed Manager Diamond Chain Factory, Indianapolis, assumed entire charge and improved and developed transmission of power by pitch chains; organized Diamond Chain and Mfg. Co., now president and owner. For past seven years

work has been along lines of high efficiency chains correcting tooth form for sprockets and installation of chain drives for machining purposes. Present position: Pres. Diamond Chain Mfg. Co., Indianapolis.

References: Wm. M. Taylor, Jno. R. Whittemore, R. C. Stevens, H. M. Leland A. L. Riker.

SIDNEY G. WALKER, 815 Banigan Bldg., Providence, R. I. Born, Greenfield, Mass., July, 1869. Education: Dartmouth College, C. E., 1893. Other engineering work: Associated Factory Mutual Fire Ins. Co.'s surveyor and draftsman, 1893–1894. Inspector and engineer 1894–1898; private engineering practice in Hilo, Hawaii, surveying, mapping and developing transportation facilities on large sugar estates, 1898–1905. Design of additional reservoir facilities for water works at Honolulu. Present position: Engineer, Manufacturers Mutl. Fire Ins Co., since 1905; consultation on the design of manufacturing plants and fire protective equipments.

References: John R. Freeman, H. S. Ferguson, John O. De Wolf, Edwin D. Pingree, John A. McGregor, E. N. French.

WILLIAM GUY WALL, Indianapolis, Ind. Born: Baltimore, Md., August, 1875. Education: B. S., Mass. Inst. of Tech., 1896. Drafting room: Charlotte Machine Co., Charlotte, N. C., 1897–1898, installing steam and electric power and lighting plants. Smith, Courtney Co., Richmond, Va., 1898–1899, electrical and mechanical engineer, installing power and lighting plants. National Motor Vehicle Co., Indianapolis, 1900–1906. Automobile manufacturers, engineering and designing electric and gasoline motors and automobiles. Other engineering work: Smith, Courtney Co., 1898–1899. Installed the large lighting and power plant at Norfolk Navy Yard, and on several torpedo boats and destroyers, also submarine boat "Plunger" at Wm. R. Trigg Co., Richmond, Va. Designed and built two cylinder gasoline automobile, 1898. National Motor Vehicle Co., Indianapolis, 1900–1901, Assistant Engineer. Chief Engineer for the National Motor Vehicle Co., 1901–1907, charge of all engineering work and designed all motor cars. 1901–1902, designed several different types of electric vehicles, including all the parts, motors, gear drives, axles, etc. 1903, designed a 20 H. P. gasoline touring car with four cylinder vertical engine; 1904, designed 30 H. P. gasoline touring car, four cylinder vertical engine with shaft drive. 1904–1905, 40 H. P. four cylinder touring car, six cylinder touring car, the first six cylinder touring car placed on the American market. 1906–1907, 50 H. P. four cylinder touring car and 75 H. P. six cylinder touring car. Present position: Mechanical engineer, National Motor Vehicle Co., Indianapolis, Ind.

References: J. R. Whittemore, G. L. Crook, Theo. Weinshank, H. E. Troutman, Hugo Diemer, G. E. Merryweather.

ARNOLD ERNST WEICHERT, 224 North 5th St., Newark, N. J. Born, New York, December, 1875. Education: Stevens Institute of Technology, M. E., 1897. Special course in engineering chemistry under Dr. Thos. B. Stillman, 1897. Apprentice: Four months Wm. Cramp and Sons, Philadelphia, Pa. Drafting room: Marine Engine & Machine Co., Harrison, N. J., 1901–1904; charge of acetylene generator construction department; supervision of the construction of the engine for Alco-Vapor launches, and the design and construction of elevator

cars. Robins Conveying Belt Company, May-July, 1904. J. G. White power house design, 1904–1906, piping, conveyor systems, steel and concrete construction, as well as inspection of work built by outside contractors Chapman Producer Gas Company, New York, Nov. 1906 to present; engineer, design of an improved automatically poked gas producer for both power and heating purposes. Other engineering work: Electrical engineering, Institute of Correspondence Instruction, instructor in chemistry and physics 1½ years. Present position: Engineer, Chapman Producer Gas Company, New York; design of an improved automatically poked gas producer for both power and heating purposes.

References: F. A. Scheffler, D. S. Jacobus, B. N. Jones, C. B. Peck, L. B. Lent.

NATHAN R. WICKERSHAM, Corning, N. Y. Born: Philadelphia, Pa., February, 1874. Education: Newton High School, Franklin Institute and Drexel Institute. Apprentice: Pencoyd Iron Works and Pendrick & Ayer, 1890–1894. Drafting room: Frank Young, in charge erecting steel structural work, April to November, 1894. Tool and tool attachment designing, Bethlehem Steel Co., assisting Mr. F. W. Taylor, 1902. Shop experience: Electric Traction Co., Philadelphia, in charge maintenance of rolling stock, 1894–1895. Bement, Miles & Co., in charge machine shop in part, 1894–1900. Bethlehem Steel Co., miscellaneous charge then full charge of the Taylor system in Ordnance Dept., acting as Assistant Supt., 1900–1903. Rand Drill Co. and Ingersoll-Rand Co., engaged in design of new plant, Painted Post, N Y., Oct., 1903 to date. Present position: Superintendent Painted Post Plant, Ingersoll-Rand Co.

References: Fred W. Taylor, F. W. Parsons, H. L. Gantt, Carl G. Barth, A. L. Gath.

HENRY SHOTWELL WOOD, New York City. Born: Philadelphia, Pa., December 1860. Education: B. S., Swarthmore, 1880; C. E., Swarthmore, 1883. Apprentice: Bridge designing and building, Dept. B. & B., P. R. R., 1881–1885. Drafting room: P. R. R. Bridge Dept. Assistant to Jos. M. Wilson, 1881–1885, in charge of strain and section calculations. Shop experience: Inspector of drawbridge machinery, P. R. R., 1881–1885. Designer and Inspector of special contractor's plant, San Francisco Bridge Co., 1887–1906. Other engineering work: Specialized since 1887, as designer and builder of hydraulic dredges for New York Dredging Co., Atlantic Gulf and Pacific Co., etc. Complete design, alteration and building of suction dredges. Present position: Engineer and Eastern Agent of North American Dredging Company.

References: Alex Miller, Wm. D. Forbes, Chas. W. Baker, Henry B. Seaman, Robert M. Dyer.

HARRY WILMOT WOODWARD, Cleveland, Ohio. Born, Painesville, Ohio, March, 1868. Education: Two years, Case School of Applied Science; Adelbert College, A. M., 1895. Drafting room: Waddell-Entz Company design of generators 1891–1893. Westinghouse Co., general drawing, 1895. Cleveland Electric Illuminating Company design of electrical part of plant, 1896–1898. Brown Hoisting Company, structural drawing, 1899–1900. Other engineering work: Assistant supervising engineer, City of Cleveland, O., in charge of power plant inspection and of issuing permits for boilers and stacks. 1900–1906. Designed and installed power heating and lighting plant for the Cleveland Arcade Company

Reinforced concrete building and power plant for C. S. Britton; in charge of design for power plant for Standard Welding Company, also for power plant and heating, ventilating and lighting of Technical High School for City of Cleveland, 1906; Present position, general manager of the Cleveland Engineering Company.

References: C. H. Benjamin, C. F. Brush, E. J. Cook, W. J. Reilly, W. R. Warner.

HARRY THURBER WOOLSON, Gas Engine & Power Co., Morris Heights, N. Y. Born, Wallington, N. J., Sept. 1876. Education; Stevens Institute of Technology, M. E., 1897. Drafting room; National Meter Co., Brooklyn, N. Y., 1897–1898; Gas Engine & Power Co., March, 1899 to date; chief draftsman of engineering department for past three years. Shop experience; In naval service five months, as machinist in engineering division on ship board. Other engineering work; Designing in connection with 3 torpedo boats and two gun boats built by company for U. S. Government; for the past three years specially interested in the development of large marine explosive engines; suction gas producer for marine engines; propeller wheels for large yachts; testing of boilers and gas engines Present position; Chief draughtsman of engineering department, Gas Engine and Power Co., and Chas. L. Seabury.

References; Franklin De R. Furman, Lewis H. Nash, Albert E. Guy, R. C. Monteagle, J. Alvah Scott.

FOR PROMOTION TO FULL MEMBERSHIP

CHARLES WARREN BOYER, Box No. 10, Somerville, Mass. Born, Seneca, Kansas, December 1871. Education: Brooklyn Polytechnic and Pratt Inst. Apprentice: Francis H. Boyer, 1885–1890. Drafting room: De La Vergne Refrigerating Co., 1889–1893. Shop experience: J. P. Squire, & Co., 1893–1896; latter date, in business as a consulting engineer, formed a co-partnership with Francis H. Boyer, as consulting engineers, 1900. Other engineering work: Cold storage plants for state institution for Massachusetts at Tewksbury, Danvers, Worcester; Cold storage plants, Boston Homeopathic Hospital, Worcester City Hospital, Wesson Memorial Hospital, etc.; forced draft Waban Rose Conservatories, Natick, Mass.; rebuilding power plant Danvers Insane Hospital; rebuilding refrigerating plant, Boston Storage Warehouse Co. Present position, Engineering firm of Francis H. & Chas. W. Boyer, Somerville, Mass.

References: Peter Schwamb, Chas. A. G. Winther, Francis H. Boyer, Albert C. Ashton, Ernest W. Day.

Elected Junior, 1900.

EDWIN STIMBLE BOYER, 93 Fairview Ave., Plainfield, N. J. Born: Philadelphia, Pa., April 1875. Education: Three years University of Penn., Phila., Pa. Drafting room: N. Norris Craven Elev. Works, Phila., Edge Moor Iron Co., Edge Moor, Del., 1896–1897. Shop experience: University of Penna., 1893–1896; Booth Garrett & Blair, Phila., 1897–1899. Other engineering work: Mechanical engineer in charge of power testing department, Booth, Garrett & Blair, Phila., 1897–1899; N. Y. Mgr. American Engine Co., New York City, 1899–1905. Present position: Mechanical engineer, office of Walter Kidde, 1905 to present. In charge of design and construction of steam power plants, fire protection systems, power transmission, etc., at plants of Brunswick-Balke-Collender

Co., Long Island City; New York & Brooklyn Casket Co., Brooklyn, N. Y.; Prasoda Apartments, New York City; American Hard Rubber Co., College Point, N. Y.; Barrett Mfg. Co., Peoria, Ill., etc.

References: D. S. Jacobus, Wm. Kent, A. A. Cary, F. H. Boyer, C. W. Scribner, H. W. Spangler.

Elected Associate Member, 1902.

ABEL DELANCEY CATLIN, President of Chattanooga Machinery Co., Chattanooga, Tenn. Born: Schuyler Co., New York, December 1848. Apprentice: Silsby Manufacturing Co., Seneca Falls, N. Y., 1868, tools, such as taps, dies, reamers, etc. Drafting room,: Silsby Manufacturing Co., designed and built special machinery for doing their work. Member of Smalley Bros & Co., Bay City, Mich., designed and built foot boring mill, two and a half years. Shop experience: Silsby Manufacturing Co., about nine years. Smalley Bros. & Co., 2½ years. Standard Machinery Co., Bay City, Mich., five years. Chattanooga Machinery Co., 19 years, various kinds of machinery built by these concerns. Other engineering work: Engaged in building and designing special saw mill machinery, keyseating machinery, pin machinery, lead pencil machinery, etc.; now special valves for steam feeds for saw mills and outfit for making wood screws and machinery for making wagon felloes. Present position: President of Chattanooga Machinery Co.

References.: Newell Sanders, Wm. H. Hume, Wm. Gleason, Leslie Moulthrop, Chas. E. Ferris.

Elected Associate Member, 1906.

FREDERICK DAVIS HERBERT, 816 Prospect Place, Brooklyn, N. Y. Born, Brooklyn, N. Y., Oct., 1873. Education; M. E., Cornell University, 1897. Drafting room, Harlan & Hollingsworth Co., Wilmington, Del., 1898–1899. Perth Amboy Terra Cotta Co., 1899–1900, installing electric lighting system, new machinery, surveying and rebuilding; special testing of coal, kiln burning, and drying. Other engineering work; 1900–1903, consulting engineer; designed power stations Doylestown & Easton R. R., etc. Made several special tests of machinery and power plants, developed plans of special machinery, drew up reports, etc., as usual to consulting engineer; 1901–1905, editor of "Marine Engineering;" 1905, Allis-Chalmers Company. Present position; engineer and salesman, New York, Allis-Chalmers Company.

References; Wm. F. Durand, George W. Bacon, Edw. T. Adams, W. D. Forbes, Wm. H. Rowley, Warren Johnson.

Elected a Junior, 1899.

FREDERICK MATTHEW HITCHCOCK, 80 East Washington Square, New York. Born, Westfield, Mass., October, 1873. Education: 4 years Worcester Polytechnic Institute, S. B., 1895. Drafting room: 1½ years as a draftsman for the Powell Planer Company., Worcester, Mass., dating from the fall of 1895. Shop experience: Went with the Rand Drill Company, manufacturers of compressed air machinery, in the spring of 1897. Was located at Tarrytown factory for three years. During that time had charge of the Cost department, did the estimating work, and continually handled engineering correspondence. Other engineering work: Was transferred to home office of the Rand Drill Company, New York, in spring of 1900 as an engineer-salesman; designed and supervised

the construction of L. B. McCabe & Bros. power plant for their New York subway work, and similar plants; about two years later, was put in charge of New York sales dept. of the Rand Drill Company, with responsibility for engineering sales, involving the various kinds of engineering problems incident to pneumatic installations for mining, tunneling, industrial power plants, etc.; held such position until the Rand Drill Company was merged in the Ingersoll-Rand Company, July, 1905. Continued in the employ of the new company as engineering correspondent. Was made assistant to general manager of sales, August, 1906, employed in handling general engineering and selling correspondence received direct from customers and from all branches and agents of the company. Present position, Assistant to general manager of sales, Ingersoll-Rand Company.

References: H. V. Conrad, F. A. Halsey, S. S. Jordan, H. T. Abrams, W. S. Morehouse, F. W. Parsons.

Elected Junior, 1899.

SAMUEL HOLLINGSWORTH, 171 East Front St., Plainfield, N. J. Born, Scotch Plains, N. J., Nov., 1873. Education; M. E., Stevens Inst., 1896. Apprentice; One summer in shops, Brown & Sharpe Mfg. Co., June–Sept., 1896. Drafting room; Six years, Campbell Printing Press & Mfg. Co., New York, and Potter Printing Press Co., Plainfield. Shop experience; Experimental work in shops, and traveling superintendent, erection of new machines for both of the above corporations. Other engineering work; with Cambpell Company, designer in charge of general line of printing machinery and auxiliaries, also in charge of important experimental work in machine shops. With Potter Co., development of special printing presses, other automatic machinery, and superintending erection of new machinery on the road. Present position, last four years devoted to consulting engineer and the manufacture of printing presses and machinery for paper specialties.

References; Geo. W. Campbell, James E. Denton, D. S. Jacobus, Jas. 1. MacMurray, Geo. E. Greenleaf.

Elected a Junior, 1899.

JOHN PARKER ILSLEY, 111 Broadway, New York. Born, Philadelphia, Pa., October, 1876. Education, Mass. Inst. of Tech., S. B., 1897. Drafting room: With Bell Telephone Co., of Phila., from August 1, 1898 to Feb. 1, 1899; was engineer and draftsman in the maintenance and right of way dept., drawing plans and layouts for new connections, including the superintending of overhead connections for all subscribers in the city of Wilmington, Del., when the common battery system was introduced. Shop experience: With the Simonds Rolling Machine Co., of Fitchburg, Mass., 1897 to 1898; work largely experimental under Mr. F. W. Taylor, principally in tempering and hardening department. Charge for several months of automatic hardening machine., management of the automatic heating apparatus, water cooling system, also steam apparatus for tempering. Other engineering work: Engineer with the Elkin Coal Company, New Brunswick, Canada; included all the engineering work and the superintendence of the construction of a new "slope" to the mine, together with the actual surveying, plotting, and laying out therein, as well as charge of the work itself; tunnel work started both on the surface and from the interior of the mine, both ends being worked simultaneously and meeting mid-way; work included new survey of the mine, running new entries, straightening old, laying out a spur track a

mile long to the new opening, and planning and superintending a system of surface drainage with view of drying up swamps and providing a rapid disposal for rain water; Niles-Bement-Pond Company past three years involved, in addition to the management of the sales dept., in New York, work as a consulting engineer in regard to the selection of the proper shop equipment for outside customers and the proper machine tools, both as to type and as to quantity, for a given production; involves the planning and laying out of a complete machine shop for the purpose in view. Present position: Charge of the New York sales office, Niles-Bement-Pond Co., New York.

References: R. C. McKinney, Walter L. Clark, Geo. T. Reiss, Wm. J. Hagman, J. Sellers Bancroft, A. E. Cluett.

Elected a Junior, 1903.

ROYAL R. KEELY, City Engineer, Edmonton, Alta, Canada. Born: Cherryvale, Kansas, Sept. 1876. Education: Cornell University, E. E., 1900; M. M. E., 1901. Apprentice: Providence, R. I., Locomotive Works, 1903–1906. Shop experience: R. I. Locomotive Works. 1901–1904, Westinghouse, Church, Kerr & Co., and Westinghouse Machine Co., office work and erecting power plant and electric railway machinery. Other engineering work: 1904–1905, professor of engineering, University of South Dakota. 1905–1906, contracting and consulting engineering practice at Sioux Falls, South Dakota. City engineer, Edmonton, Alta, 1906, to present time, N. W. T., Canada, operating municipal light and power plants, pumping and water works stations, telephone plant, sewage system, sanitation and garbage disposal and general city work. Present position: City Engineer, Edmonton Alta, N. W. T., Canada operating municipal plants as outlined above.

References: R. C. Carpenter, H. R. Kent, E. L. Phillips, W. S. Austin, O. S. Shantz.

Elected a Junior Member, 1901.

D. T. MACLEOD, 30 E. Cedar Avenue, Merchantville, N. J. Born: Canton, Mass., April 1873. Drafting room: Fay & Burbank, Boston, special machinery. Horace Brown, Boston, Mass., patent office drawings. C. F. Gooding, Boston, on special machinery. Westinghouse, Church, Kerr & Co., New York, on car shop and power house design. Other engineering work: Eight and a half years, West End St. Ry. Co., and Boston Elevated Ry. Co. in mechanical and civil engineering departments, work including cars, trucks, power plant design, coal pockets, wharves, car houses, etc. Inspector of construction on car house and power house work, one and a half years. Charge of building work and equipment Boston Subway, two and a half years in civil engineering department. Three years United Coke and Gas Co., New York, one year of that time at Cape Breton. Assistant engineer on construction of 400 by-product ovens; prepared all plans for Sparrows Point Plant; Buffalo and Lebanon, Duluth, Sharon and Canadian extension. Much original work in by-product oven design and condensing house apparatus. Present position: Assistant engineer, American Coke & Gas Construction Co., design and construction by-product coke oven plants and gas machinery, having charge of all engineering work, designing, construction, sales, etc.

References: H. L. Coburn, H. P. Quick, A. T. Nickerson, L. J. Hirt, C. G Atwater.

Elected an Associate, 1901.

JOHN SAMUEL MILLER, The Bucyrus Co., South Milwaukee, Wis. Born, Harrisburg, Pa., November 1872. Education; M. E., Lehigh University, 1895. Drafting room; Harrisburg Foundry and Machine Works, parts of 1895–1896–1897. About one year engine fitting and testing. Mazapil Copper Co., Concepcion del Oro, Zacatecas, Mexico. 1897–1898, mine surveying and mapping. Other engineering work; Last part of 1898 and Jan. of 1899, Harrisburg Foundry & Mfg. Works, chief draftsman. Taught spring term in mechanical engineering department of Lehigh, 1899. 1899–1902, superintendent of boilers for Bethlehem Steel Company, had charge of water works also during latter part of time. Made numerous boiler tests. Engine and boiler testing, Colorado Fuel & Iron Co., March-Oct., 1902. Steam and hydraulic engineer for National Rolling Mills, McKeesport, Pa., Oct., 1902–July, 1903. Present position, estimating engineer for the Bucyrus Co., July, 1903 to present time.

References; S. L. G. Knox, Prof. J. F. Klein, Archibald Johnston, A. H. Helander, B. T. Allen.

Elected a Junior, 1900.

GORDON SCOTT RUTHERPORD, Solvay Process Co., Detroit, Mich. Born, Montreal, Canada, October, 1875. Education: McGill University, B. A. Sc., 1896. Other engineering work: Tecumseh Salt Co., Detroit, Mich., in capacity of assistant superintendent in responsible charge of construction and repair work, designing and building grainer plant and general enlargement 1897–1899; Sarnia Salt Co., manager, rebuilding and operating plant, 1899–1901; Solvay Process Co., Detroit, assistant to manager soda ash department, in charge of experimental work and general operating, 1901–1907. Present position: Assistant to manager soda ash department; charge engineering work experimental character, with gas producers, steam plant, and chemical apparatus employed in the manufacture of soda ash and its by-products.

Elected Junior Member, 1901.

References: W. B. Cogswell, E. N. Trump, G. M. Brill, C. G. Herbert, S. G. Barnes.

JOSEPH CARL SCHAEFFLER, Tremont Bldg., Boston, Mass. Born, New York, May 1877. Education: Stevens Institute, M. E., 1900. Drafting room: Draftsman and assistant engineer of New York Automobile Company. designing and superintendence, erection of small steam engines, gasolene engines, etc.; draftsman and assistant engineer Patton Vacuum Ice Company, of New York and Baltimore, steel tanks, lead lined acid tanks, special pumps, and general refrigerating machinery; and also some structural steel work. Other engineering work: Assistant to George H. Barrus, Boston, Mass. Test for securing the economy of fuel, specifications, estimates and superintendence for new steam plants, improvements of old plants, etc.; work consisted in assisting Mr. Barrus and afterward taking responsible charge; charge of designing and detailing heating and ventilating work, boiler designing, tests of patented steam appliances, tests on various kinds of fuel. About six months a large part of the time devoted to design of compound rotary steam engine for W. A. E. Henrici; December, 1903, engineering work on own responsibility, including expert tests for suppression of smoke; expert tests in connection with the substitution of Diesel oil engines for the steam plant tests of 2–100 h. p. gas engines, or compressors and generating plant involved in a law-suit for unfulfilled guarantees; designed heating plant; Lowell Weaving Co. Kennedy

Valve Mfg. Co., Elmira N. Y., Corbin Screw Corp. New Britain, Conn., etc., present position: Civil and mechanical engineer, also consulting engineer and manager for the positive differential system of steam circulation; consulting work in connection with plan for heating ten buildings with exhaust steam to be taken from a large power station, near Cleveland, Ohio, which design of pipe tunnel.

References: Wm. T. Donnelly, D. S. Jacobus, Adam Riesenberger and Wm. T. Bonner, W. H. Bristol.

Elected Associate Member, 1904.

ALBERT WILLIAM THOMPSON, Amoskeag Mfg. Co., Manchester, N. H. Born, Charlestown, Mass., February, 1874. Education: Massachusetts Institute of Technology, S. B., 1896. Apprentice: Amoskeag Mfg. Co., 1896–1899; cotton manufacturing and general shop and clerical work. Drafting room: Amoskeag Mfg. Co., 1899–1900; general drawing room work in mill engineering and machine design. Shop experience: Superintendent of Amoskeag Mfg. Co.'s machine shop and foundry since August, 1900, in charge of machinery and power plant repairs and construction under Chas. H. Manning. Other engineering work: Full charge of some 400 to 500 men for past six years; hold patent for expansion shaft coupling of own design, 1899; continually using devices of own design. Present position: Superintendent of machine shop, Amoskeag Mfg. Co., Manchester, N. H.

References: Chas. H. Manning, Prof. Peter Schwamb, Harte Cooke, Frederick C. Fladd, Fred. A. Flather.

Elected a Junior Member, 1900.

LEWIS WEHNER, Milwaukee, Wis. Born: Salzungen, Saxe-Meiningen, Germany, December 1876. Education: Mass. Inst. of Technology, course in Naval Architecture, 1901–1903. Drafting room: 3 months Albro Clem Elevator Co., Philadelphia, Pa., Warren Webster Co., 1893–1901, design of feed water heaters and other steam specialties, layout of power plants, heating and ventilating systems. New York Ship Building Co., detailing of ship's hulls, Feb.-Sept., 1901. The Bucyrus Co. draftsman, assistant estimator and checker since 1903–1905. Other engineering work: Chief Draftsman on steam shovel, wrecking crane, dipper, suction and elevator dredge work, Bucyrus Co., 1905, present time. Present position: Chief Draftsman, The Bucyrus Co.

References: S. L. G. Knox, Jay M. Whitham, John A. Serrell, Otto C. Wolf, Warren Webster.

Elected Junior, 1901.

SEMEN WEINBERG, St. Petersburg, Russia. Born: Rostoff, Russia, March, 1872. Education: M. E., Michigan College of Mines, 1900. Shop experience: Four years connected with J. A. Fay & Egan Co. and Laidlaw, Dunn, Gordon Co., in charge of their offices in St. Petersburg, Russia. Manager of "Isolabor" Asbestos Manufacturing Works; Consulting engineer for E. Tillman & Co., St. Petersburg. Designed several water works of Russian cities, principal being Nicolajeff. Present position: Manager of the Worthington Pump Co., Ltd., St. Petersburg.

References: Walter Laidlaw, William Schwanhausser, Karl Eilers, Geo. J. Foran (By-Law 2).

Elected Junior Member, 1901.

TO BE VOTED FOR AS ASSOCIATES

EMANUEL ANDERSON, Mexican Light & Power Co., Mexico City, Mexico. Born, Christiania, Norway, April 1875. Education; University of Michigan, B. S., M. E., 1899. Drafting room; G. S. Metcalf Co., Chicago, Ill., July, 1899-1900, details and layouts grain elevators and conveying machinery, 1900-1901. Draftsman, Sargent and Lundy, on layouts and details for power plants, work covered about ten stations, 1901–1903. Chief draftsman with Northwestern Elevated, Lake St. Elevated and Union Loop of Chicago, 1901–1903; charge of power station details and construction, design of 2 rotary substations. Chief draftsman on new steel work for three mile extension of elevated road, including stations, track layouts and details of rolling stock. Other engineering work; Charge of design and construction under Mr. R. F. Hayward, 1903-1905, on new substation, design of new 10,000 kilowatt steam turbine station remodeling of receiving stations and alterations in pipe line power plants and reservoirs, for Utah Light & Ry. Co., Salt Lake City, Utah, 1905–1903. Mexican Light & Power Co., R. F. Hayward. Assistant engineer and chief draftsman, detail and design for 2 railway and light substations, design for 5 Government pumping stations, aggregating 5000 h. p., also design for remodelling steam plant. Present position, April 1907 to date, chief of engineering department, M. L. & P. Co., assistant engineer on city distribution including reconstruction of overhead and underground system.

References: Wm. S. Monroe, Aug. Hanson, F. Sargent, J. R. Allen, Prof. M. E. Cooley.

HARRY WARFIELD ANDERSON, Atlanta, Ga. Born: Baltimore, Md., Dec. 1865. Other engineering work: Harrisburg Foundry and Machine Works, Southern Manager, Atlanta, Ga., designed and equipped complete power and lighting plants, laid out complete plant, furnished steam and electrical machinery and installed and started plant. Majestic Hotel, Atlanta, Ga.; purchased and installed, electrical equipment, City of Pulaski, Va., made drawings for changing over plant and recommendations for new equipment; Speegle Lumber Co., rearranged entire steam plant, bought new equipment and installed same. Present position: Manager engineering sales and purchasing agent, N. P. Pratt Laboratory and Fulton Foundry & Machine Works, Atlanta.

References: Benj. T. Allen, Wm. Hardie, W. P. Caine, J. C. Bertsch, W. H. Hume.

CHARLES SAMUEL BAVIER, New York City. Born: Jersey City, N. J., March 1850. Apprentice: Oakville Engine & Foundry Company, 1870–1872, steam engine, forging and machine tools. Drafting room: Shop drawing and sketching in connection with above, 1872–1874. Assistant to George K. Radford of Vaux & Radford, Chief Engineer Public Works, Buffalo, N. Y. Shop experience: W. W. Goodman Meter Co., Philadelphia, Pa., master mechanic; station meter and gas apparatus, 1879–1881. American Meter Co., New York, M. M., engaged with same class of work, 1882–1884. Other engineering work: J. L. & W. H. Hastings, Contractors, Pittsburg, Pa., master mechanic, designed and erected special machininery connection with their work, 1874–1879, instaling machinery and power plant, Louisiana Sugar Refinery Co., 1884–1886. Reengaged by same firm as night superintendent, charge of new plant and the refin-

ing process, 1886–1888. Charge of designing and erecting power plant, New Orleans Cotton Exchange, Leeds & Co., 1888–1889. Willswood Plantation, La., charge of erecting bagasse furnace in connection with B. & W. Boilers, 1889. Designed and granted basic letters patent for Vacuo-Despatch System, now in successful commercial operation. Present position: Chief Engineer of Metropolitan Life Building.

References: Robert M. Anderson, Frederick E. Murphy, D. Lewis Holbrook, Thomas F. Flinn, Reginald P. Bolton, John James Chisholm.

CHARLES ROBERT BIRDSEY, U. S. Gypsum Co., Chicago, Ill. Born: Chicago, Ill., 1880. Education: M. E., Lewis Institute, 1902. Drafting room: G. M. Brill's office, Chicago, 1902–1905. Other engineering work: Acted as superintendent of construction in the building of two or three power plants, fertilizer plant and several plaster mills; charge of alterations and extensions of oil mill. For past two years in charge of all construction work with U. S. Gypsum Company.

References: Geo. M. Brill, Geo. W. Williams, P. M. Chamberlain, Alexander Mosely, C. E. De Puy.

PAUL TULANE BRUYERE, 527 West 124th St., New York, N. Y. Born, Newark, N. J., March, 1879. Education: Princeton University, C. E., 1901. Other engineering work: Rodman C. R. R. of N. J. on track elevation through Newark, N. J., 1901–1902. Material man on construction of steel office buildings. Thompson-Starret Co., New York, 1902–1903; assistant superintendent on construction of Bailey building, Philadelphia; assistant superintendent on construction Atlantic Addition, William St. and Exchange Place, New York; assistant superintendent on construction new Wanamaker store, Philadelphia, Pa., Thompson Starrett Company, 1903–1905. Standard Plunger Elevator Company, Assistant superintendent on New York work, 1905–1906. Present position: General superintendent of construction, Standard Plunger Elevator Company, superintending construction department, including its manufacturing plant at Worcester, Mass.

References: James Owen, A. W. Howe, Harold B. Atkins, Thure Larsson, Prof. F. N. Wilson.

CHARLES B. BUERGER, 712 City Hall, Philadelphia, Pa. Born: Vienna, Austria, January 1878. Education: B. S., City College of New York, 1898; B. M. E., Stevens Inst. of Tech., 1900. Drafting room: Atlantic Refining Co., Philadelphia, Pa., Chief Draftsman, 1905–1906. Other engineering work: Assistant engineer of construction, Atlantic Refining Co., 1900–1905, mechanical and civil buildings, mills, powerhouses, engines, boilers, pumps, tanks, etc. Bureau of Water, 1906–1907, repairs of pumps and boilers. Present position: Mechanical engineer, Bureau of Filtration, Philadelphia, Pa.

References: J. E. Denton, A. P. Trautwein, G. H. Taber, J. M. Whitham, A. J. Fuller.

ALEXANDER GRAHAM CHRISTIE, Allis-Chalmers Co., 71 Broadway, City. Born, Manchester, Ont., Canada, November 1880. Education; Three years School of Practical Science, University of Toronto. Shop experience; Summers 1899–1900, Madison Williams Company, Port Perry, Ontario, Canada. Westing-

house Machine Co., East Pittsburg, Pa., steam turbines doing machine work, testing, experimental work, and outside erection, 1901–1904. Other engineering work; Charge of steam turbine exhibits Westinghouse Machine Company, Louisiana Purchase Exhibition, August and September, 1904. Instructor in mechanical engineering, Cornell University, 1904–June, 1905. Erection of first steam turbines built by Allis-Chalmers Company, June to Dec., 1905. Assistant superintendent at New York office, Allis-Chalmers Company, in charge of steam turbine erection, Dec., 1905 to date. Present position, assistant to District Superintendent of erection, New York office, Allis-Chalmers Company.

References; A. M. Mattice, H. W. Rowley, A. W. Smith, J. E. Lord, R. C. Carpenter, Max Rotter.

CHARLES WARRINGTON EARLE CLARKE, 1231 Grand Central Station, New York, N. Y. Born, Chicago, Ill., January 1879. Drafting room: Hawley Down-Draft Furnace Co., Chicago, 1897–1899; Fraser & Chalmers, Chicago, 1899–1900; Stirling Co., 1900–1901; Armour & Co., 1901–1902; Sargent & Lundy, June to Dec., 1902, chief draftsman. Other engineering work: Assistant engineer, charge of various power plant installations, Sargent & Lundy, 1906–1907; Armour & Co., designed several power and refrigerating plants, the most notable at East St. Louis, 3500 h. p. capacity. Sargent & Lundy responsible charge of drafting, design, specification and construction work covering installations aggregating a total of not less than 100,000 k.w. normal cap., at the Fisk St. sta. of the Commonwealth Electric Co., Chicago, Twin City Rapid Transit Co., Minneapolis, Norfolk and Portsmouth Traction Co., and others. Present position, Steam engineer, electrical department, N. Y. C. & H. R. R. Co., NewYork, N. Y.

References: Frederick Sargent, W. S. Monroe, E. B. Katte, Carl Schwartz, W. S. Love, Chas. G. Y. King.

WILLIAM CRARY DART, Providence, R. I., Born: Providence, R. I., April 1869. Education: Mass. Institute of Technology, 1891. Shop experience: Rhode Island Tool Co., 1891–1892. Other engineering work: Associated with executive departments, Rhode Island Tool Co. Present position: Secretary of Rhode Island Tool Co.

References: Henry D. Sharpe, John R. Freeman, Warren S. Locke, William A. Viall, F. A. Chase, R. A. Robertson.

OSCAR H. FOGG, 4 Irving Place, New York. Born: Philadelphia, Pa., September 1879. Apprentice: Cadet engineer, Yonkers works of United Gas Improvement Co., Philadelphia, 1899–1900. Drafting room: United Gas Improvement Co., on various work in Westchester Co., N. Y., 1899–1900, supervision of drafting, part of duties of present position. Shop experience: Steam and gas fitting and machine repairs in shop United Gas Improvement Co., Yonkers, N. Y., 1899–1900. Other engineering work: In charge of works and manufacturing departments under direction of the Superintendent, U. G. I. Company's Yonkers works, 1900–1901. Superintendent Newton and Flushing Gas Co., Flushing, L. I., in charge of works and all mechanical departments, 1901–1902. Designed, and in charge of distribution system and construction of gas works, Ocean City, N. J., and put same into operation; in charge of operation of plant for three months after completion, 1902–1903. Consolidated Gas Co. of New York, engineer in charge of construction of 36 inch transfer main; since completion of work,

charge of pressure division and engineering force department of mains and services, 1904 to date. Present position: Engineer department of mains and services, Consolidated Gas Co. of New York.

References: Alex. C. Humphreys, John D. Logan, Alfred E. Forstall, Sterling F. Hayward, W. H. Bradley.

ARTHUR PERCY HAGAR, The Rail Joint Company, Troy, N. Y. Born, Newark, N. J., August 1879. Education; Stevens Inst. of Technology, M. E., 1902. Drafting room; Continuous Rail Joint Co., of America, Newark, 1903–1904–1905. Other engineering work; Instructor, experimental mechanics, Stevens Institute, June-July, 1902; foreman in charge of pig-iron mixer, Illinois Steel Co., South Chicago, Ill., 1902, assistant engineer; engaged in drafting room; inspector of rail joints, at Albany Iron Works and of raw materials at various mills; in charge supervision of application of rail joints in track, and as local salesman, Continuous Rail Joint Company, of America, 1903–1904–1905. Present position; assistant superintendent, The Rail Joint Company, Troy, N. Y., since Jan., 1906.

References; Wm. J. Bradley, D. S. Jacobus, L. A. Williamson, F. De R. Furman, B. G. Braine, Wm. H. Bristol.

HUGH HENRY HANNA, JR., Atlas Engine Works, Indianapolis, Ind, Born: Lafayette, Ind., Feb., 1876. Education: Mass. Institute of Technology, 2 years special. Drafting room: Atlas Engine Works. Shop experience: Atlas Engine Works, going through all departments, 1900 to date. Present position; Vice President Atlas Engine Works.

References: H. E. Trautman, G. L. Crook, J. R. Whittemore, W. M. Taylor, R. C. Stevens.

ROGERS BONNELL HART, Elmira, N. Y. Born, Cora, Kansas, December 1874. Education: Three years English High and Manual Training School Apprentice: Chicago Screw Company, in drawing room, automatic machinery and tools, 1892–1896. Drafting room: Crane Company, Chicago, valves and fittings; March to June 1899, Adams and Westlake Co., Chicago Railway Equipment, 1899–1902. Crane Co., Chicago, 1902–1904; draftsman and tool designer with the Western Electric Company, Chicago, March to May, 1902; chief draftsman with the Eaton, Cole and Burnham Company, Bridgeport, Conn., 1904–1905, charge of equipment of the plant and assisted in the design of the product. Shop experience: Walker and Ehrman Mfg. Co., Chicago, as shop superintendent, 1896–1899. Other engineering work: Crane Co., Chicago, consulting engineer on power plant equipment, 1905–1906. Present position: Mechanical engineer, Kennedy Valve Mfg. Co.,

References: A. J. Caldwell, T. C. Finn, A. J. Hewlings, F. W. Parsons, A. B. Moore.

H. K. HATHAWAY, Germantown, Philadelphia, Pa. Born: San Francisco, Cal., April 1878. Education: 2 years Williamson Trade School. Apprentice: Machinist Trade. Midvale Steel Co., General machine shop work. Testing tools, making up speed, feed, and capacity tables for the various machines in the shops, sketching work for the purpose of setting piece rates etc; Drafting room; Design jigs, fixtures, special tools, and to follow up and push along their manufacture in the shops. Shop experience: During the Spanish War, Inspector at the

plant at Elmira, New York, Payne Engineering Company, to whom a large contract for machining projectiles had been sublet by Midvale Steel Co. Foreman of the Projectile Shop at Midvale, year and a half, also charge of the building of ammunition trucks for disappearing gun-carriages. Foreman of the tool-rooms in various machine shops, charge of the designing, making, storage, issuing and upkeep of all tools, fixtures and jigs; the testing of tools made from the new high speed tool steel then being developed. Experimental work in connection with belt dressings, cutting compounds and special tools. Other engineering work. In Oct., 1902, accepted the position of Supt. of the Payne Co., charge of a foundry, machine shop, pattern shop, smith shop, and drafting room, managing the shops, testing engines and a small amount of designing. Installed the "premium system." 1904, Link Belt Engineering Co., work under Mr. Carl G. Barth, in connection with installing the "Taylor System." After a month at Link Belt was sent to the Tabor Mfg. Co. to take charge of the installation of "Taylor System" there. Present position: Tabor Mfg. Co., charge of the installation of the "Taylor System," and at present installing the System for Dodge & Day, throughout their entire organization.

References: Fred W. Taylor, Harris Tabor, Wilfred Lewis, Carl G. Barth and James M. Dodge.

CHARLES HUBBARD HILL, 305 Lenox Rd., Schenectady, N. Y. Born, West Troy, N. Y., September, 1869. Education: Troy Academy. Rensselaer Polytechnic Institute, Troy, N. Y. Drafting room: C. G. Witbeck, C. E., Troy, N. Y., 1895–1899. General Electric Company, Schenectady, N. Y., 1899–1901. Shop experience: General Electric Company, 1902 to present time following work in the factory. Other engineering work: Assistant foreman switchboard drafting department General Electric Company, in charge of the mechanical designing section, 1901–1902. 1902 to present time designing engineer in the switchboard engineering department, General Electric Company; charge of the design of circuit breakers, lightning arresters, operating mechanisms, lever switches, etc. Present position, Designing engineer switchboard engineering department, General Electric Company.

References: E. M. Hewlett, C. D. Haskins, A. F. Batchelder, J. W. Upp, A. L. Rohrer.

JOSEPH LILBURNE HILLER, Stephen Girard Bldg., Phila., Pa. Born: Mattapoisett, Mass., December 1878. Education: Friends School, Providence, R. I., 4 years. Drafting room: Diamond Machine Co., Providence, R. I., 1898–1899. Builders' Iron Foundry, Providence, R. I., 1899–1904; machine designing and chief draftsman, conducting work through pattern shop, foundry and machine shop, and estimating for new and special machinery. Original design of special, automatic grinding, and other machinery, involving the adaptation to special requirements. Other engineering work: Surveying and plotting, 1897. Designing special machinery and study of patents, Mattapoisett, Mass., 1904–1905. Engineer with the General Pneumatic Tool Co., Montour Falls, N. Y. Present position: Mechanical Engineer, Pennsylvania Crusher Co., Jan. 1906, to date designing and superintending the construction of coal crushers and installation for same.

References: Richard H. Rice, John G. Aldrich, Wm. H. Kenerson, Luther D. Burlingame, Warren S. Locke.

CHESTER WATERS LARNER, 2079 E. 40th Street, Cleveland, Ohio. Born: New York, N. Y., 1880. Education: Four years Baltimore Polytechnic Institute. Drafting room: Designer hydraulic department, I. T. Morris Co., Philadelphia, Pa., 1904–1905. New Jersey Bridge Co., Manasquan, N. J., 1905. Other engineering work: Instructor of mechanical drawing, University of Chicago, 1901–1902. Mechanical Engineer International Steam Pump Co., New York, designing, installing and testing pumping machinery. Present position: Hydraulic Engineer, Wellman, Seaver, Morgan Co., in charge of the department.

References: W. M. White, Wm. Schwanhauser, Carl Geo. de Laval, A. T. Bruegel, Geo. J. Foran.

COLIN MACBETH, Atlas Engine Works, Indianapolis, Ind. Born: Bolton, England, December 1880. Education: Technical Schools of Bolton. Apprentice: John and Edward Wood, Bolton, England, machinist, erector and draftsman 1896–1901. Drafting room: John and Edward Wood, Bolton; Atlas Engine Works, Indianapolis, 1899–1901, 1904–1905–1906. Shop experience: Bolton, England, John and Edward Wood; Mather & Platt Ltd., Manchester, England, 1896–1904. Other engineering work: Building steam and explosion engines for automobiles and designing same at various times from 1901–1904, also cotton spinning and weaving. Six months building and designing, two cycle kerosene engines, 1902; Mather & Platt, Manchester, assistant superintendent, 1902–1904, varied work, management, tool and jig design, screwing and tapping machinery, rate setting etc., designing kerosene engines, stokes, molding machines, cranes, etc., 1904–1905. Superintendent of boiler shop, 1905; water tube boiler erection and new and orginal designs of same. Present position: Mechanical engineer Atlas Engine Works.

References: R. C. Stevens, J. R. Whittemore, W. G. Crook, J. A. Bechtel, H. E. Troutman.

VINCENT E. McMULLEN, 211 Park Ave., Beloit, Wis. Born: Dodgeville, Wis., Sept. 1880. Education: B. S. University of Wis., 1905. Shop experience: Fuller & Johnson Mfg. Co., Madison, Wis., engaged in erecting, testing and experimenting with gasolene engines, 1902–1903. Other engineering work: With Baker Mfg. Co., Evansville, Wis., 1904–1907. Designed a gasolene engine and superintended the building of the three sizes; recently chosen general superintendent of the company. Present position: Experimental department, Fairbanks, Morse & Co., Beloit, Wis., since April, 1907.

References: D. C. Jackson, Storm Bull, O. B. Zimmerman, F. G. Hobart.

GEORGE HAWTHORNE PERKINS, Lowell, Mass. Born, Salem, Mass., April 1877. Education; S. B., Mass. Institute of Tech., 1899. Drafting room; Ludlow Mfg. Co., engaged in mill engineering work including mill and power house plans, instrument work and machine drawing in jute and twine machinery, 1899-1900. Other engineering work; Lowell Textile School, 1901–1907. Instructor in mechanics and machine drawing; preliminary plans of new buildings. Supervision of installation of shafting and power equipment in new buildings; plans and supervision of alterations in buildings summer 1906; machine designing for inventors and machine concerns; boiler test at Bigelow Carpet Co., Lowell, Mass. Present position, head of textile engineering department, Lowell Textile School.

References; Franklin Nourse, Arthur T. Safford, Frederick A. Flather, W. W Crosby, Edw. F. Miller.

CLYDE RICHMOND PLACE, 314 Madison Ave., New York, N. Y. Born, Mount Upton, N. Y., September 1877. Education, Mass. Inst. Technology, S. B., 1902. Apprentice: Brooks Locomotive Works, summers 1900 and 1901; tracing, drawing, and simple locomotive construction designing. Shop experience: Brooks Locomotive Works, locomotive assembling, construction and laying out casting details from working drawings, summer 1900. Other engineering work: Liability inspector of factories, elevators and construction work for Travelers Insurance Co., Hartford, Conn., 1902–1903; responsible charge of the liability inspection department in Greater New York for same company, 1903–1905; designing draftsman for elevators and general mechanical work for Grand Central Station architects, 1905–1906; charge of mechanical and electrical department in equipping Lexington Ave. temporary station, the work incident to the new terminal for the New York Central Ry. Co. and the mechanical features of the electric zone stations; original design of two baggage elevators, designer of an elevator car patent and workman's time clock. Present position: In charge of the mechanical and electrical department for the Grand Central sta. architects, preparing plans and specifications and superintending the work for the architects.

References: Peter Schwamb, Geo. A. Orrok, Chas. R. Pratt, B. P. Flint, Chas. W. Aiken.

BERT W. SEAWELL, 1108 Traction Bldg., Cincinnati, Ohio. Born, Atlanta, Ga., February 1877. Education; Georgia School of Technology, B. S., M. E., 1898. Apprentice; Atlanta Water Works, engineering department, 1898–1899, installation of filter system. Drafting room; Lockwood, Greene & Co., 1899–1902, Boston, Mass., draftsman and assistant superintendent of construction. Other engineering work; assistant engineer, The Rhode Island Company, Providence, R. I., charge of drafting room in which was designed a central power station, costing $1,250,000, substations for high tension 11,000 volt, transmission lines, car houses, etc., 1902–1904. Westinghouse, Church, Kerr & Co., New York, worked on plans for New York terminal station of the P. N. Y. & L. I. R. R., 1904–April, 1906; plans of Harrison, N.J., Power Station, for the P. N. J. & N. Y. R. R., April to August, 1906. Present position, assistant to consulting engineer of Cincinnati Traction Co., and affiliated with Ohio and Indiana interurban lines. Designing power stations, substations for high tension, transmission lines, car houses, repair shops, etc.

References; Fred. N. Bushnell, Howard L. Coburn, J. S. Coon, Thos. Elliott, Adolph Suck.

ERNEST BURCHARD SELLEW, 51 Allen Ave., Pawtucket, R. I. Born, Hartford, Conn., March 1876. Education; Hillyer Institute. Apprentice; Pratt & Whitney Co., Hartford Conn., 1892–1896. Drafting room; Pratt & Whitney Co., drafting and designing, machine tools, guns, special machinery, fixtures, tools, etc., 1896–1899; Potter & Johnson Mach. Co., Pawtucket, R. I., charge of drafting department, designing machine tools, 1899–1907. Shop experience; Potter & Johnson Mach. Co., mechanical engineer on installation and production. Other engineering work; Designed and patented automatic lathes; jointly designed and patented Potter and Johnson "Automatic" turret-lathes. Responsible charge of design, installation and demonstration of special automatic machinery for the manufacture of projectiles at the artillery arsenal of M. M. Schneider and Cie., Creuset, France. Present position, mechanical engineer and

chief draftsman, Potter and Johnson Mach. Co. Works, Pawtucket, R. I. and Paris, France; directing design of automatic machine tools for automatic manufacture of machine parts, guns, motors, automobiles, etc.

References; E. R. Bullock, F. C. Pratt, D. S. Seymour, F. A. Waldron, L. E. Whiton, F. H. Robinson.

FOSTER CORNELL SLADE, Westinghouse, Church, Kerr & Co., 10 Bridge St., New York. Born, Yonkers, N. Y., April 1874. Education; Cornell University, M. E., 1897. Apprentice; United Gas Improvement Company, Philadelphia, 1897–1898; street main construction and general complaint work. Drawing room; 1898–1900, James R. Floyd's Sons, N. Y., six months in 1903 with Cons. Gas Co., N. Y.; two years with Universal Gas Co., one year James R. Floyd's Sons, N. Y. Engineering work; Designed and built gas works at Staunton, Va., Marguand and Poor, New York, 1900. Supt. of construction of power house at Wilmington, N. C., 1902–1903; reconstructed 99th St. Gas Works 1904 for Cons. Gas Co., as Supt. of construction; gas expert for Universal Gas Company, 1900-1902, investigating commercial value of patented gas process. Present position, engineer, Westinghouse, Church, Kerr & Co., New York, general engineering.

References; W. S. Austin, H. O. Pond, S. F. Hayward, A. T. Nickerson, H. R. Kent.

FREDERICK WILLOUGHBY WESTON, Burnham, Mifflin Co., Pa. Born, New York, N. Y., May 1879. Education; B. A., Yale University, 1899. Apprentice; Baldwin Locomotive Works, Burnham Williams & Co., locomotive building, 1899–1901. Drafting room; Repair Shop, Baldwin Locomotive Works, 1901–1902. Shop experience; Baldwin Locomotive Works, 1902–1903. Other engineering work; Foreman of Spring Shop, Standard Steel Works, June, 1903 to present time. Present position, Foreman Spring Shop, Standard Steel Works, manufacturing locomotive and car springs.

References; A. A. Stevenson, Samuel M. Vauclain, W. W. Atterbury, H. V. Wille, William Burnham.

JAMES WRIGHT WILSON, 10 Bridge St., New York. Born, Brooklyn, N. Y., October, 1872. Education: Brooklyn Polytechnic. Apprentice: General Electric Company, Schenectady, N. Y., expert course machine shop; armature winding and testing dept. 1891–1893. Shop experience: Warren Lozier, New York, electrical contractors and machinists, supt. of shop, 1893–1895. Other engineering work: Selling and engineering for Westinghouse, Church, Kerr and Co., Power Mining Machinery Co., & Westinghouse Machine Co., 1895 to date. Present position, Salesman with Westinghouse Machine Company.

References: Henry R. Kent, L. L. Brinsmade, Edwin Yawger, Walter C. Kerr, and H. D. Watson.

FOR PROMOTION TO ASSOCIATE GRADE

ELMER GOULD EBERHARDT, 66 Union St., Newark, N. J. Born, Newark, N. J., April, 1881. Education: Cornell University, M. E., 1904. Apprentice: Gould and Eberhardt, complete machine shop, gear cutting machines, shapers, drill-presses, and special machinery. Drafting room: Gould and Eberhardt, Newark, N. J., machine tools, 1897–1901, Manufacturers Contracting Co.,

Newark, N. J., structural iron work, June-Sept., 1902; Tirril Gas Mach. Co., Newark, N. J., 1903. Shop experience: Eberhardt Bros. Mach. Co., Newark, N. J., gear cutting and machine tools, Sept., 1904 to date. Other engineering work: Design and equipment of tools and power of Eberhardt Bros. Mach. Co., including three additions to same; patents on gear cutting machinery, design of new line of gear cutting machines, design of shop fixtures and jigs for manufacture of shapers and gear cutters. Present position, Vice president and in charge of works Eberhardt Bros. Mach. Co.

References: John A. McGregor, A. W. Jacobi, Edgar P. Earle, F. A. Halsey, F. H. Colvin.

Elected Junior Member, 1904.

KENNETH LOCKETT, 5116 Madison Ave., Chicago, Ill. Born: October 1880, Chicago, Ill. Education: B. S., Mass. Institute, 1902. Shop Experience Mechanical Engineer for Chicago Car Wheel & Fdy. Co., Chicago, in charge of mechanical end of entire plant including all new buildings, etc., 1902–1903. Hawley Down Draft Furnace Co., Chicago, on design work. About eight months, 1903, Mechanical Engineer for Adams and Schwab consulting mechanical and electrical engineers, Chicago, design work for power plants and all branches of mechanical and electrical work for 1 year and 10 months, ending Oct., 16, 1906. Present position: Mechanical Engineer for Electrical Installation Co., Chicago. Have charge of all steam work for above concern.

References: H. J. Hartsmann, G. T. Ladd, G. R. Brandon, F. H. Keyes, E. Mc.K. Hagar and E. F. Miller.

Elected Junior Member, 1904.

EDWARD FRANKLIN SCHAEFER, 50 Broadway, New York. Born, New York, N. Y., November, 1879. Education: College of the City of N. Y. B. S. 1900, Cornell, M. E., 1902; M. M. E., 1903. Apprentice: Rand Drill Company, compressor and drill erection, 1903. Drafting room: Instructor at Cornell inconnection with fellowship under J. H. Barr, and R. C. Carpenter, 1902. Other engineering work: Ingersoll-Rand Company, sales and publication department, 1903–1906 in New York; Poto Mines Corporation, chief engineer, 1906, in Poto, Peru, S. A.; Rinconada Mining Co., consulting engineer, 1907, in Poto, Peru, S. A. Present position: Chief engineer, Poto Mines Corp., consulting engineer, Rinconada Mining Co. mining, Placer gold dredging and quartz mining.

References: R. C. Carpenter, D. S. Kimball, H. T. Abrams, John H. Barr, Wm. Fox.

Elected Junior Member, 1903.

MARSHALL L. WHITNEY, Tucson, Arizona. Born, Astoria, N. Y., August 1876. Education; City College, N. Y. Drafting room; Wheeler Condenser & Eng. Co., 1902–1904. Full charge of the design of all air pumps for large power and turbine installations. A. S. Cameron Pump Works, 1905. Other engineering work; With M. T. Davidson as draftsman and later as chief draftsman and assistant superintendent. In Oct. and Nov., 1905, prospected successfully for water for the U. S. Army at Ft. Niagara. Present position, traveling representative, A. S. Cameron Pump Works.

References; E. W. Christie, W. S. Love, W. A. Drewett, C. H. Wheeler, E. M. Coryell.

TO BE VOTED FOR AS JUNIORS

JOSEPH WHEELER AYLSWORTH, 10 Bridge St., New York City. Born: Newport, R. I., September 1880. Education: S. B. , Mass. Institute of Technology, 1903. Other engineering work: Westinghouse, Church, Kerr & Co., assistant engineer, engaged in regular office engineering consisting of costkeeping, buying, overlooking designs, and other detail work. Bought all material and helped design power plant of Procter & Gamble soap factory at Kansas City. Neptune Meter Co., Long Island City; Middleton, Pa. Present position: Engaged in buying material for railroad shops for the W. & L. E. R. R., Brewster, O.

References: A. T. Nickerson, W. D. Steele, Wm. McClellan.

ALBERT HENRY BATES, 48 Sanford Street, Muskegon, Mich. Born, Hopkins, Minnesota, October 1882. Education; M. E., University of Minnesota, 1905. Apprentice; About one year erecting machinist and boiler makers helper, Minnesota Sugar Co., Minneapolis, Minn. turret lathe operator, International Harvester Co., Chicago, Ill., about two months. Drafting room; International Harvester Co., Chicago, Ill., work on jigs, molding machinery, special machines, etc., June 1901, to Sept., 1903. J. S. Kemp Co., Waterloo, Ia., June to Sept., 1904. Other engineering work; Ordnance Office, U. S. Army, Washington, D. C., draftsman on siege and field artillery, June, 1905, to June, 1906. Dominion Coal Co., Glace Bay, Nova Scotia, design piers, head frames and coal handling machinery, June 1906, to October. Present position, draftsman, The Shaw Electric Crane Co., Muskegon, Mich., designing trolleys and hoisting machinery.

References; Professor J. F. Flather, Otto Albert and William A. Young.

W. WALLACE CORE, 28 Sherman Ave., Newark, N. J. Born: Washington, D. C., Jan. 1878. Drafting room: Brown Hoisting & Conveying Machine Co., Cleveland, crane department. Baldwin Locomotive Works, machine repair and construction department; Dixon Locomotive Works, Scranton Locomotive works. Lackawanna R. R. car shops, Scranton, car drawing and miscellaneous machinery; Shop experience: Complete transit survey of a soft coal mine of 800 acres; charge of operation and repairs of electrical apparatus and electrical coal cutting machinery of another mine. Other engineering work: Laying out mechanical illustrations, International Correspondence Schools, Scranton, 1901–1903; structural detailing for Purdy & Henderson, N. Y.; iron construction for Eugene Hedden, Newark; coal mine machinery drawing and design for Penna. Coal Co., Dunmore, Pa.; design and construction of an inventor's complicated engine valve gear, engine testing and experiments, 1904; N. Y. Edison Co., and Ford, Bacon & Davis; complete charge of the design and construction of machinery at Steeplechase Park, Coney Island, 1905. Present position: Checker and designer of machinery, New Jersey Bridge Co., structural checking and drawbridge machinery designing.

References: C. B. Peck, W. E. Dodds, H. M. Lane, F. D. Potter.

ROBERT L. CORK, Ft. Wayne, Ind. Born: Speaker, Mich., February 1878. Education: B. S., Michigan, Agricultural College, 1902. Drafting room Stacey Mfg. Co., Cincinnati, O. 2 years W. G. Construction Co., Ft. Wayne, Ind. Shop experience: 1 year Enterprise Boiler Co., Youngstown, O., as template maker and layerout on blast furnace work; about 1 year as machinist Buckeye Eng. Co. Other engineering work: Original designs include steel mill building,

steel tank, gas-holders. Present position: Gasholder engineer, Western Gas Cons. Co.

References: O. N. Guldin, C. L. Weil, T. N. Case.

KERR MURRAY CRESSLER, Fort Wayne, Ind. Born: Fort Wayne, Ind., October 1883. Education: Ph. B. Sheffield Scientific School, Yale University, 1905. Present position: Assistant engineer, Kerr Murray Mfg. Co.

References: C. B. Richards, F. L. Bigelow, Theodore N. Case.

EDWIN HALSTED DAVIS, 410 Gates Ave., Brooklyn, N. Y. Born, Brooklyn, N. Y., October, 1881. Apprentice: Davidson's Steam Pump Works, general machine work, 1898–1901, general pumping machinery. Drafting room: Davidson's Steam Pump Works, draftsman, 1901–1905, chief draftsman, 1905 to date; designing general pumping machinery, evaporating and condensing apparatus; complete pump and condenser equipments for marine service; water works installation. Shop experience: Davidson Steam Pump Works, Brooklyn, N. Y. Present position: Chief draftsman Davidson's Steam Pump Works, designing pumping machinery in general.

References: M. T. Davidson, Wm. A. Drewett, Reginald P. Bolton.

JAMES BROWNRIGG DILLARD, Sandy Hook Proving Ground, N. J. Born Norfolk, Virginia, April 1882. Education: Three years Tulane University; four years U. S. Military Academy, graduate. Shop experience: Course in machine shop management and practice at Sandy Hook Proving Ground. Other engineering work: Proof officer at Sandy Hook Proving Ground, N. J., tests of all materials manufactured by the Ordnance Department or purchased under contract. Present position: U. S. Army Officer, Captain Ordnance Department.

References: H. F. Rugan, E. L. Jahncke, W. B. Gregory.

JOHN G. DODWELL, New York, N. Y. Born, New York, N. Y., August 1879. Shop experience: Electrical and mechanical. 1½ yrs. H. Mettelstardt, New York, N. Y.; 1½ yrs. C. E. Hoffman, New York, N. Y.; one year Raritan Copper Co., Perth Amboy, N. J.; one year in business, New York. Other engineering work: First assistant and chief engineer, 1900–1902, Westchester Lighting Co., City Island, N. Y.; chief engineer, Westchester Lighting Co., White Plains, N. Y., 1902–1904; electrical department Hotel Astor, 1904–1905; night engineer Roosevelt Hospital, 1905–1906. Present position: Chief engineer, 14th St. store, New York, N. Y., care and operation of steam, electric and refrigerating plants.

References: Geo. A. Hofmeyer, W. E. Crane, T. E. Morford.

SAMUEL BARRY FLAGG, Alton, Ill. Born: Alton, Ill., November 1882. Education: B. S., University of Illinois, 1904. Drafting room, Equitable Powder Mfg. Co., East Alton, Ill., 1904–1906. Other engineering work: Part time in drafting room on the design and detailing of buildings, machinery. Equitable Powder Mfg. Co., and also for two or three associated companies. Part of the time superintending the building of powder machinery and in overseeing repairs in various parts of the plant. Present position: Observer in Boiler Division of Fuel Test Plant of U. S. Geological Survey.

References: L. P. Breckenbridge, C. M. Garland, F. W. Olin, E. S. Crane, D. T. Randall.

ARTHUR ALDRICH HALE, 565 W. Adams St., Chicago, Ill. Born, St. Louis, Mo., May 1882. Education; University of Illinois, B. A., 1905. Drafting room; Etna Foundry & Machine Co., Springfield, Ill., June-Sept., 1904. Shop experience; H. W. Caldwell & Son, Chicago, Ill., July-Sept., 1903. Other engineering work; Griffin Wheel Co., Chicago, Ill., since July, 1905, general inspector, mechanical inspector. Present position, special inspector, construction work, Griffin Wheel Co.

References; A. B. Moore, L. R. Shallenberger, L. P. Breckenbridge.

WILLIAM DIEHL HAMERSTADT, 27 E. Pratt St., Indianapolis, Ind. Born, Lafayette, Ind., January 1885. Education; Purdue University, B. S. in M. E., 1905. Drafting room; draftsman, National Drill & Mfg. Co., Barberton, Ohio, summer of 1904. Shop experience; machinist, Illinois Steel Works, South Chicago, Ill., summer of 1903. Other engineering work; engineer, New York Telephone Company, 1905–1907. Present position, engineer, The Rockwood Mfg. Co., Indianapolis, Ind.

References; W. F. M. Goss, M. J. Golden, Wm. F. Wiley, J. R. McColl.

CHARLES ALTON HOWARD, 55 Duane St., New York, N. Y. Born, Portland, Me., October, 1884. Education: Mass. Inst. of Technology, S. B., 1906. Apprentice: Grand Trunk Railway Shops, 1901–1906. Drafting room: New York Edison Co., 1906 to date. Shop experience: Grand Trunk Shops, 1901–1906. Other engineering work: Lumber Inspector Grand Trunk Railway. Present position, Asst. to the mech. engr., New York Edison Co., power plant design.

References: George A. Orrok, Howard L. Coburn, J. P. Sparrow, Gaetano Lanza.

ROBERT E. LEE, care Westinghouse, Church, Kerr & Co., 10 Bridge St., New York City. Born: Coldwater, Michigan, June 1879. Education: Three years University of Michigan. Drafting room: Pressed Steel Car Co., Pittsburg, Pa., 1900–1902. National Tube Co., Pittsburg, Pa. Other engineering work: Charge of one division of drafting room during the construction of the Lorain Pipe Mills, 1902–1904. Present position: Engineer with Westinghouse, Church, Kerr & Co., engineering work on the Central Power Station of the Pennsylvania Ry. Co.

References: Henry R. Kent, Geo. B. Caldwell, M. M. Upson.

ALFRED W. MELLOWES, 29 Broadway, New York, N. Y. Born, Dayton, Ohio, April 1879. Education: Cornell University, M. E., 1906. Apprentice: Stilwell-Bierce & Smith-Vaile Co., 1896–1897–1899; detail and design of water wheels, power plants, pumping machinery, air compressors, refrigerating machinery, etc. Drafting room: Stilwell-Bierce & Smith-Vaile Co., 1896–1899–1905; Thresher Electric Co., Dayton, O., 1898; Bethlehem Steel Co., 1900 Fay & Bowen Engine Co., Geneva, N. Y., 1901, chief draftsman and designer and 6 months in 1903. Design of turbine pumps and high head water wheels for Platt Iron Works Co., Dayton, O., summer of 1905. Shop experience: Two years general shop practice, computing Scale Co., Dayton, Ohio, 1894–1895. Other engineering work: Engineer in the railway engineering equipment department of the General Electric Co., Schenectady, N. Y., 1906. Present position: Mechanical engi-

neer, Arthur Giesler, consulting engineer; design, erection and supervision of hydraulic power plants, and hydro-turbine pumping stations.

References: A. W. Smith, Ernest S. Bowen, Geo. A. Buvinger, Alfred A. Thresher.

EARL NEWMAN PERCY, Berlin, Germany. Born: Eureka, California, August 1878. Education: 2 years at California School of Mechanical Arts, San Francisco. Apprentice: C. N. W. R. R. machine shops, as machinist. Drafting room: Geo. E. Dow Pumping Engine Co., draftsman. Later, 1899–1901, work on pumping machinery exclusively. Tracing and designing. C. N. W. R. R. Co., Eureka, Cal., intermittently to 1899. Union Iron Works, 1891–1905. Byron Jackson Machine Works, assistant engineer. Shop experience: Part of same year as hoisting and pumping engineer for the Bunker Hill & Sullivan Mining & Milling Co., Idaho. Other engineering work: Byron Jackson Co., absolute charge of all lesser work and small plants in process of erection. Present work: Technische Hochschule, testing steam turbines of several types, centrifugal pumps and gas engines.

References: Wm. A. Doble, Geo. W. Dickie, R. S. Moore.

HERBERT SHAW PHILBRICK, 13 Dalton St., Waterville, Me. Born, Waterville, Me., April, 1875. Education: Colby College, A. B., 1897. Mass. Inst. of Tech., B. S., 1906. Drafting room: Webber and Philbrick, summer of 1905; Keyes Fibre Co., Shawmut, Me., June-July, 1906. Shop experience: Lombard Steam Log Hauler Co., Waterville, Me., from Oct., 1906 to present time. Present position: Draftsman with Lombard Steam Log Hauler Co.; drawings of the Lombard logging engine.

References: Peter Schwamb, E. F. Miller, Gaetano Lanza.

ARTHUR FREDERICK PITKIN, Automobiles Berliet, Lyons, France. Born, Providence, R. I., November 1881. Education: One year Rensslaer Polytechnic Inst., 1899, one year. Stevens, 1900. Apprentice: American Locomotive Co., 1901–1904, lathes, boring mill, slotter, boiler shop. Drafting room: Amer. Loco. Co., 1899–1900 and eight months in 1904; designs on Malay type engine. Shop experience: Schenectady shops and Loco. Mach. Co., Montreal, in charge of tool room. Other engineering work: Providence American Locomotive Automobile Company, charge of installation of machine equipment; later in charge of machine shop, spring of 1906. Present position: Representative, American Locomotive Automobile Company, securing materials and representing the company in France.

References: J. E. Sague, J. McNaughton, A. M. White.

JAMES POSEY, 859 Calvert Bldg., Baltimore, Md. Born, Oakville, Maryland, January 1877. Education; Graduate of Maryland Institute. Apprentice; Keen & Hagarty Mfg. Co., Baltimore, in machine shop, 1896–1900. Drafting room; Keen & Hagarty Mfg. Co., Baltimore, chief draftsman and assistant foreman of machine shop; charge of all erecting of machines, engines and repairs to same, designed automatic machinery, charge of the building of same. Consulting engineer and draftsman with Henry Adams, Baltimore, 1900–1901, and retained as such when Henry Adams and Martin C. Schwab formed a partnership. Shop experience; Keen & Hagarty Mfg. Co., 1896–1900. Other engineer-

ing work; Adams and Schwab, 1902 to present time, assistant engineer, since 1903, direct charge of designing and superintendence of heating, ventilation, power plants, plumbing, electric lighting and power installation and elevator plants. Present position, assistant engineer, Adams and Schwab, designing, heating, ventilating, power plants, electric lighting and power installations, plumbing equipments, hydraulics, central station work.

References: Henry Adams, Harvey Middleton, H. L. Hart.

EJNAR POSSELT, St. Louis, Mo. Born, Nakaskov, Denmark, 1883. Education; M. E., Technical College, Copenhagen, Denmark, April, 1902. Apprentice; Tuzen and Hammerich Engineering Works, engine builders, 1897–1900, engine work. Drafting room; Vilter Mfg. Co., Milwaukee, Wis., 1903–1904, St. Louis Iron and Machine Works, 1904–1905. Shop experience; De La Vergne Machine Co., May to December, 1902. Other engineering work; 1¾ years designer and draftsman with the St. Louis Iron and Machine Works. Since Dec. 1, 1905, mechanical engineer and designer in charge of new work with St. Louis Portland Cement Co., St. Louis, Mo. Present position, mechanical engineer, St. Louis Portland Cement Co.

References; Fred E. Bausch, P. De C. Ball, M. L. Holman.

WILLIAM HENRY SMEAD, General Fire Extinguisher Co., Atlanta, Ga. Born: Cohoes, N. Y., Feb. 1881. Education: One year A. & M. College of North Carolina, 1900–1901. Apprentice: Park Mfg. Co., 1895–1899, engine pumps and elevators. Drafting room: Richmond and Petersburg, Va., W. R. Trigg Ship Yard Co. and Petersburg Iron Works, 1899–1900; government work, marine engines and shells. Shop experience: Burlington, Iowa and Quincy, Ill.; Murray Iron Works; Central Iron Works, 1901–1903; Corliss Engines, Boilers and Gas Engines. Other engineering work: Designed power plants for White Oak Cotton Mills, Greensboro, N. C., Southern Power Co., Charlotte, N. C.; New Orleans Water Works plant; Pelzer Mfg. Co., turbine plant; Columbia Elec. St. Ry. Light & Power Co.; also other plants ranging from 300 to 2000 H. P. each including 20 steam turbine plants. Present position: Mechanical engineer, charge of the engineering department designing and erecting, steam power plants, automatic sprinkler installations, General Fire Extinguisher Co.

References: Arthur L. Rice, Wm. L. Church, F. S. Tucker, E. C. Wiley, J. R. Fordyce.

BEN WADLEY STEELE, Dothan, Ala. Born: New York, August 1883. Education: Georgia School of Technology, Atlanta, Ga. Apprentice: Enterprise Lumber Co., and in shops of the Hawkinsville & Southern Florida. Other engineering work: Second vice president and assistant manager Atlanta & St. Andrews Bay Ry., having charge mechanical and operating department. Present position: Second vice president and assistant manager.

References: Geo. Hillyer, Jr., J. S. Coon, H. M. Norris.

LOUIS T. STEVENSON, San Antonio, Tex. Born: Pittsfield, Mass., May 1884. Education: Ph.B., Yale University, 1906. Apprentice: Allis-Chalmers Co., molder in foundry, green sand, dry sand and loam work, 1906. Present position: Getting out plans and devices for automobiles.

References: Charles B. Richards, Pomeroy W. Power, Edwin H. Lockwood.

WILLIAM BENEDICT UIHLEIN, Milwaukee, Wis. Born, Milwaukee, Wis., Jan. 1880. Education; University of Wisconsin, B. S., 1904. Apprentice; Jos. Schlitz Brewing Co., three summers, lathe, milling machine, shaper, planer, etc., general repair work. Drafting room; Special work at J. Schlitz Brewing Co. Shop experience; Nordberg Mfg. Co., one summer in erecting department. Other engineering work; Refrigeration work for the past six years. Testing of plants. Compile data for superintendent on all engineering work; refrigerating machines ; power plants; pumping station and engineering in general. Present position, assistant to Alfred Uihlein.

References; Bruno Nordberg, C. H. Williams, Fred M. Prescott, Storm Bull, John D. Mack, Geo. P. Dravo.

LEONARD GREEN VAN NOSTRAND, 525 Monroe Ave., Scranton, Pa. Born: Lansingburgh, N. Y., February 1881. Education: M. E., Cornell University, 1906. Apprentice: American Locomotive Works, Scranton, Pa., summer 1905, brake motion and valve setting. Chief Engineer in charge of all design with Tuohill Iron Works, Scranton, Pa., 1906–1907, rolling mill engines, hoisting engines, complete with drum, etc. General breaker design, including rolls, screens, conveying lines, etc. Present position: General Manager, Scranton Machine Works, Feb., 1907 to date.

References: Dexter S. Kimball, Rufus J. Foster, Robert L. Shipman.

EARL WHEELER, Washington Barracks, Washington, D. C. Born: Bridgeport, Kansas, August 1884. Education: 4 years Kansas State Agricultural College, Manhattan, Kansas, B. S. in E. E., 1905. Graduate student, Cornell University, taking advanced electrical and mechanical engineering, Sept. to Dec., 1905. Other engineering work: Assisted in compiling and computations on electric railway tests of the Electric Railway Test Commission, St. Louis, 1904. Member of Board of Engineers to investigate the Niagara Falls situation, July, 1906, and report to the Secretary of War, through the Chief of Engineers in connection with "An Act for Control and Regulation of the Waters of Niagara River, etc." Associate member, American Institute of Electrical Engineers. Present position: Head of Dept. of Electricity and Mechanical Engineering, Engineer School, U. S. A., instruction of Engineer Officers of the Engineer Corps, U. S. Army for a portion of the year, remainder of time doing testing and research work along power station lines for Engineer Department.

References: Prof. Albert W. Smith, Prof. Rolla C. Carpenter, and B. V. Swenson.

SAMUEL HAMILTON WOODS, Columbia University, New York, N. Y. Born, Port Jervis, N. Y., June 1882. Education; M. E., Cornell University, June, 1906. Shop experience; Locomotive roundhouse work with Erie Railroad Company, at Port Jervis, N. Y., July, August and September, 1905. Present position, assistant in mechanical engineering, Columbia University, and editorial representative of the "Horseless Age." Instruction in machine design and hydraulics, and editorial work, chiefly technical.

References; Albert W. Smith, R. C. Carpenter, W. N. Barnard, D. S. Kimball.

CALVIN SHELOR WRIGHT, Calhoun, Georgia. Born, Petersberg, Georgia, July, 1878. Education: Georgia School of Technology, B. S., in M. E., 1900.

Other engineering work: 1900–1905, charge of the instruction in machine shop practice and part of the work in mechanical engineering as assistant prof. at Clemson College, Clemson College, S. C. 1905–1906, mgr. and supt. of the Calhoun Brick Co., Calhoun, Ga. Present position, Investigating Portland cement materials.

References: J. S. Coon, Wm. H. Boehm, John J. Wilmore.

RICHARD LLEWELLYN YATES, 1034 N. Main St., Dayton, Ohio. Born: Washington, Michigan, December, 1882. Education: Michigan Agricultural College, S. B., 1903. Drafting room: Platt Iron Works, Co., Dayton, Ohio, June, 1903 to present time. Other engineering work: Stilwell Bierce, Smithe-Vaile Co., now Platt Iron Works Co., detailer on waterwheel and turbine pump work. Present position: Chief draftsman, waterwheel and turbine pump department, Platt Iron Works, Co.

References: Geo. A. Buvinger, Edw. A. Deeds, Chas. L. Weil.

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